SOUND ENVIRONMENTAL STRATEGIES
www.soundenvironmental.com

In Situ Chemical Oxidation Work Plan

sound environmental strategies

Property:

TOC Holdings Co. Facility No. 01-068
107 West Lincoln Avenue
Sunnyside, Washington

Prepared for:

TOC Holdings Co.

September 22, 2010

www.soundenvironmental.com

Sound Environmental Strategies

2811 Fairview Avenue East, Suite 2000

Seattle, Washington 98102

Prepared for:

TOC Holdings Co.
2737 West Commodore Way
Seattle, Washington 98199

In Situ Chemical Oxidation Work Plan
TOC Holdings Co. Facility No. 01-068
107 West Lincoln Avenue
Sunnyside, Washington 98944
0440-016

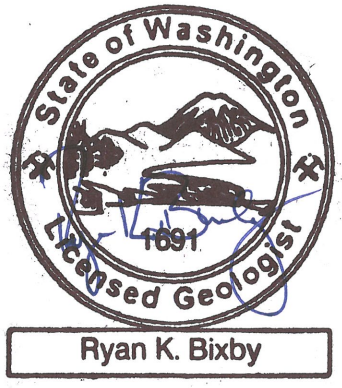
Prepared by:

Charles C. Cacek, LEG #836
Senior Geologist

Reviewed by:

Ryan K. Bixby, LG #1691
Principal Geologist

September 22, 2010



SOUND ENVIRONMENTAL STRATEGIES
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1.0 INTRODUCTION

Sound Environmental Strategies (SES) has prepared this In Situ Chemical Oxidation (ISCO) Work Plan for the TOC Holdings Co. (TOC) Facility No. 01-068, located at 107 West Lincoln Avenue in Sunnyside, Washington (Figure 1).

TOC installed a groundwater remediation system on the Cream Winery property (CWP) in 2003 and operated the remediation system until 2006. Subsequent groundwater monitoring and sampling of monitoring wells on the former TOC property indicated that the concentrations of petroleum hydrocarbons have been reduced to below their respective Washington State Model Toxics Control Act (MTCA) Method A cleanup levels; however, residual concentrations of methyl tertiary butyl ether (MTBE) remain in groundwater collected from four of the wells (MW18, RW02, RW03, and RW08) located on the western and south-central portions of the CWP. Additionally, concentrations of benzene in groundwater have been detected in groundwater samples collected recently from well RW08. This ISCO Work Plan describes the remedial injection treatment proposed for the western and south-central portions of the CWP to address these residual MTBE and benzene concentrations in groundwater (Figure 2). The ISCO treatments will be performed as an independent action under the Washington State Department of Ecology (Ecology) Voluntary Cleanup Program, Toxics Cleanup Program Identification Number 84284248, and in accordance with the MTCA Cleanup Regulations as established in Chapter 173-340 of the Washington Administrative Code.

2.0 PROPOSED SCOPE OF WORK

The purpose of this ISCO Work Plan is to describe the pre-field and field activities that will be implemented in order to perform remedial injections at the CWP. The product Klozur®CR will be used for remedial injections. Klozur®CR is a formulated product consisting of high pH-activated Klozur™ Persulfate and PermeOx® Plus engineered calcium peroxide. The material safety data sheets (MSDS) for Klozur™ and PermeOx® Plus are attached as Appendix A.

2.1 Pre-Field Activities

The scope of pre-field work associated with the ISCO treatment will include the following:

- Obtaining access and approval to complete remedial injection activities from the CWP owner.
- Preparing a site-specific Health and Safety Plan in accordance with MTCA and Part 1910.120 of Title 29 of the Code of Federal Regulations.
- Obtaining approval for an underground injection control (UIC) permit. The work will be conducted in accordance with UIC Permit No. 31093.
- Field activities will be conducted under the supervision of an SES Geologist or Environmental Scientist.

2.2 ISCO Treatment

The ISCO treatment described herein is designed to remediate MTBE and benzene contamination in groundwater at the CWP. The methods that will be employed are described below. A scope of work for the treatment follows:

1. Wells MW08, MW10 through MW15, MW17 through MW20, RW02 through RW05, RW08, and RMW09 will be opened and allowed to equilibrate with atmospheric pressure for a minimum of 15 minutes prior to obtaining groundwater level measurements.
2. Groundwater levels will be measured to an accuracy of 0.01 feet using an electronic water level meter.
3. Water quality parameters (pH, dissolved oxygen, and oxidation-reduction potential) will be monitored and recorded for all 17 wells prior to injection activities.
4. Inject one batch of remedial solution into the following wells in the following order:
   a. MW18
   b. RW03
   c. RW02
   d. RW08

   Prior to commencing injection activities, SES will confirm that the injection wells are isolated from the existing remediation system piping. Each batch of injectate will consist of three 48-pound bags of Klozur ® CR, and 150 gallons of water.
5. While injecting into each well, nearby wells will be monitored for changes in groundwater level to evaluate the radius of influence. If changes in the groundwater level are measured in nearby wells, wells further from the injection point will be measured.
6. Following injection activities, groundwater levels and water quality parameters will be monitored and recorded in wells MW08, MW10 through MW15, MW17, MW19, MW20, RW04, RW05, and RMW09.
7. Prior to leaving the CWP, the injection equipment, water quality meters, and groundwater level meters will be cleaned and decontaminated.
8. A report summarizing the injection activities and groundwater analytical results will be prepared.

3.0 SCHEDULE AND REPORTING

The ISCO treatment is scheduled to be completed in Fall 2010. We anticipate the injection event can be completed over the course of 2 to 3 days. SES will complete an ISCO Report summarizing the injection events and findings in December 2010.

FIGURES

9/23/2010

P:\0440 TOC Holdings Co\01-068 Sunnyside Lincoln\Technical\CAD\2010 ISCO WP\01-068_2010ISCOWP_CM_F.dwg

AGITATION STATION LAUNDRY

SINGLE FAMILY RESIDENCE

HEMLOCK AVENUE

SINGLE FAMILY RESIDENCE

SINGLE FAMILY RESIDENCE

SINGLE FAMILY RESIDENCE

WEST LINCOLN AVENUE

EAST LINCOLN AVENUE

FORMER PUMP ISLAND

MW01

MW02

FORMER USTS

MW03

RW01

SW01

VP-2

MW16

MW04

VP-1

RMW04

VALLEY VIEW MARKET

MW05

RMW05

FORMER IRRIGATION LINE

FORMER TRUCK WASHING FACILITY

FORMER LAB

FORMER 6" WATER PIPE

MW07

REMEDIATION COMPOUND BUILDING

MW10 (732.73')

RW06

MW06

RW08 (735.69')

732.00

731.00

WHC

CREAM WINERY PROPERTY

(FORMER CARNATION POWDERED MILK FACTORY)

RW07

RW02 (731.69')

POSSIBLE FORMER PUMP ISLAND

MW09

730.00

DOCK

FORMER COLD STORAGE

FORMER SHOP

RW03 (730.29')

RMW09 (731.92')

MW13 (729.59')

729.00

FORMER BOILER

MW08 (731.15')

MW14 (728.84')

RW04 (729.29')

731.00

RW05 (728.28')

MW15 (728.07')

728.00

730.00

FORMER WASTEWATER LINE

FORMER RAILROAD SPURS

SOUTH FIRST STREET

727.00

FORMER ETHER STORAGE

729.00

SIDEWALK

MW18 (726.84')

FORMER GAS PUMP (1960 SANBORN)

728.00

MW11 (727.72')

CONCRETE PAD

MW17 (726.70')

726.00

FORMER HYDRAULIC HOIST

FORMER TRUCK REPAIR

FORMER STORAGE

FORMER AUTO & TRUCK STORAGE

725.00

FORMER OIL RACK

FORMER SALVAGE YARD

727.00

MW19 (726.57')

MW20 (725.00')

MW12 (NM)

FLOOR DRAIN

GARAGE

726.00

725.00

FORMER OPEN DITCH

N

LEGEND

	MANHOLE
	CATCH BASIN
VP-1	APPROXIMATE LOCATION OF VAPOR MONITORING POINTS
MW18	MONITORING WELL
MW04	DECOMMISSIONED MONITORING WELL
RW04	RECOVERY WELL (GROUNDWATER AND VAPOR EXTRACTION)
RMW09	FORMER MONITORING/EXISTING RECOVERY WELL
SW01	DECOMMISSIONED SPARGE WELL
WHC	PRODUCTION WELL
	PROPERTY BOUNDARY
W	WATER LINE
SS	SEWER LINE
SW	STORMWATER LINE
GAS	GAS LINE
	EXTENT OF UST EXCAVATION
UST	UNDERGROUND STORAGE TANK
(727.72')	GROUNDWATER ELEVATION
	1-FOOT-INTERVAL GROUNDWATER CONTOUR
	GROUNDWATER FLOW DIRECTION (JUNE 22, 2010)
NM	NOT MEASURED

REFERENCE: FIGURE 2, GEOENGINEERS, 02/28/2005, AND SHEETS 14-17, GRAY & OSBORN, 4/9/07

SOUND ENVIRONMENTAL STRATEGIES
SOUNDENVIRONMENTAL.COM

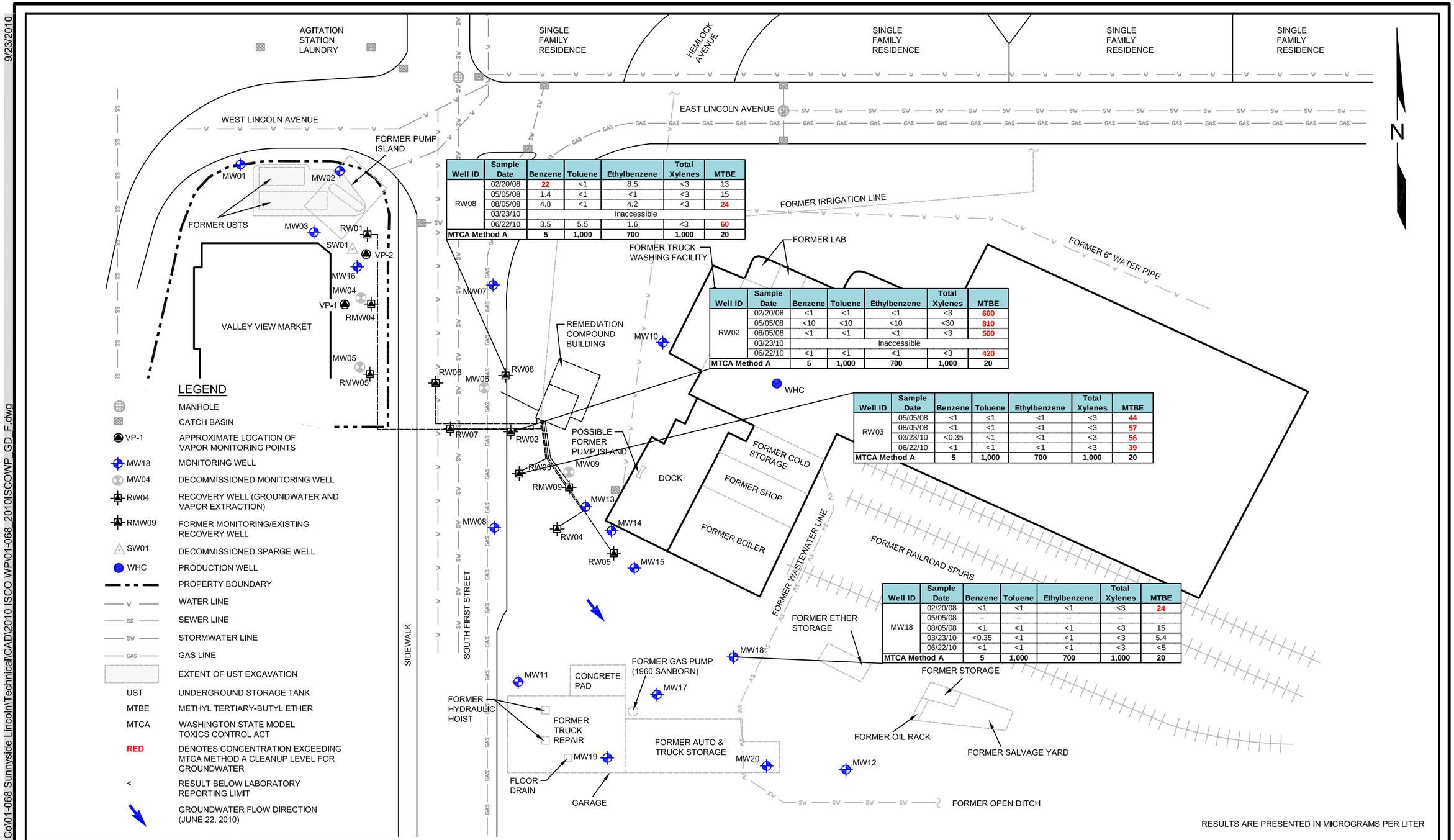
DATE: 07/12/10
DRAWN BY: NAC
CHECKED BY: RKB
CAD FILE: 01-068_2010Q2_CM

PROJECT NAME: TOC HOLDINGS CO. FACILITY NO. 01-068
SES PROJECT NUMBER: 0440-016
STREET ADDRESS: 107 WEST LINCOLN AVENUE
CITY, STATE: SUNNYSIDE, WASHINGTON

REGION:

0 25 50 100
APPROXIMATE SCALE IN FEET

FIGURE 1
GROUNDWATER CONTOUR MAP
(JUNE 22, 2010)



Well ID	Sample Date	Benzene	Toluene	Ethylbenzene	Total Xylenes	MTBE
RW08	02/20/08	22	<1	8.5	<3	13
	05/05/08	1.4	<1	<1	<3	15
	08/05/08	4.8	<1	4.2	<3	24
	03/23/10	Inaccessible				
	06/22/10	3.5	5.5	1.6	<3	60
MTCA Method A		5	1,000	700	1,000	20

Well ID	Sample Date	Benzene	Toluene	Ethylbenzene	Total Xylenes	MTBE
RW02	02/20/08	<1	<1	<1	<3	600
	05/05/08	<10	<10	<10	<30	810
	08/05/08	<1	<1	<1	<3	500
	03/23/10	Inaccessible				
	06/22/10	<1	<1	<1	<3	420
MTCA Method A		5	1,000	700	1,000	20

Well ID	Sample Date	Benzene	Toluene	Ethylbenzene	Total Xylenes	MTBE
RW03	05/05/08	<1	<1	<1	<3	44
	08/05/08	<1	<1	<1	<3	57
	03/23/10	<0.35	<1	<1	<3	56
	06/22/10	<1	<1	<1	<3	39
MTCA Method A		5	1,000	700	1,000	20

Well ID	Sample Date	Benzene	Toluene	Ethylbenzene	Total Xylenes	MTBE
MW18	02/20/08	<1	<1	<1	<3	24
	05/05/08	--	--	--	--	--
	08/05/08	<1	<1	<1	<3	15
	03/23/10	<0.35	<1	<1	<3	5.4
	06/22/10	<1	<1	<1	<3	<5
MTCA Method A		5	1,000	700	1,000	20

LEGEND

- MANHOLE
- CATCH BASIN
- VP-1 — APPROXIMATE LOCATION OF VAPOR MONITORING POINTS
- MW18 — MONITORING WELL
- MW04 — DECOMMISSIONED MONITORING WELL
- RW04 — RECOVERY WELL (GROUNDWATER AND VAPOR EXTRACTION)
- RMW09 — FORMER MONITORING/EXISTING RECOVERY WELL
- SW01 — DECOMMISSIONED SPARGE WELL
- WHC — PRODUCTION WELL
- PROPERTY BOUNDARY
- W — WATER LINE
- SS — SEWER LINE
- SW — STORMWATER LINE
- GAS — GAS LINE
- EXTENT OF UST EXCAVATION
- UST — UNDERGROUND STORAGE TANK
- MTBE — METHYL TERTIARY-BUTYL ETHER
- MTCA — WASHINGTON STATE MODEL TOXICS CONTROL ACT
- RED — DENOTES CONCENTRATION EXCEEDING MTCA METHOD A CLEANUP LEVEL FOR GROUNDWATER
- < — RESULT BELOW LABORATORY REPORTING LIMIT
- GROUNDWATER FLOW DIRECTION (JUNE 22, 2010)

RESULTS ARE PRESENTED IN MICROGRAMS PER LITER

REFERENCE: FIGURE 2, GEOENGINEERS, 02/28/2005, AND SHEETS 14-17, GRAY & OSBORN, 4/9/07

SOUND ENVIRONMENTAL STRATEGIES
SOUNDENVIRONMENTAL.COM

DATE: 07/12/10
DRAWN BY: NAC
CHECKED BY: RKB
CAD FILE: 01-068_2010Q2_GD

PROJECT NAME: TOC HOLDINGS CO. FACILITY NO. 01-068
SES PROJECT NUMBER: 0440-016
STREET ADDRESS: 107 WEST LINCOLN AVENUE
CITY, STATE: SUNNYSIDE, WASHINGTON

REGION:

0 25 50 100
APPROXIMATE SCALE IN FEET

FIGURE 2
GROUNDWATER ANALYTICAL RESULTS
(JUNE 22, 2010)

APPENDIX A

MSDS for Klozur™

MATERIAL SAFETY DATA SHEET

Klozür™

MSDS Ref. No.: 7775-27-1-12
Date Approved: 02/22/2005
Revision No.: 1

This document has been prepared to meet the requirements of the U.S. OSHA Hazard Communication Standard, 29 CFR 1910.1200; the Canada's Workplace Hazardous Materials Information System (WHMIS) and, the EC Directive, 2001/58/EC.

1. PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME:	Klozür™
SYNONYMS:	Sodium Persulfate, Sodium Peroxydisulfate; Disodium Peroxydisulfate
GENERAL USE:	In situ and ex situ chemical oxidation of contaminants and compounds of concern for environmental remediation applications.

MANUFACTURER

FMC CORPORATION
Active Oxidants Division
1735 Market Street
Philadelphia, PA 19103
(215) 299-6000 (General Information)

EMERGENCY TELEPHONE NUMBERS

(800) 424-9300 (CHEMTREC - U.S.)
(303) 595-9048 (Medical - Call Collect)

2. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW:

- White, odorless, crystals
- Oxidizer.
- Decomposes in storage under conditions of moisture (water/water vapor) and/or excessive heat causing release of oxides of sulfur and oxygen that supports combustion. Decomposition could form a high temperature melt. See Section 10 ("Stability and Reactivity").

POTENTIAL HEALTH EFFECTS: Airborne persulfate dust may be irritating to eyes, nose, lungs, throat and skin upon contact. Exposure to high levels of persulfate dust may cause difficulty in breathing in sensitive persons.

3. COMPOSITION / INFORMATION ON INGREDIENTS

Chemical Name	CAS#	Wt.%	EC No.	EC Class
Sodium Persulfate	7775-27-1	>99	231-892-1	Not classified as hazardous

4. FIRST AID MEASURES

EYES: Flush with plenty of water. Get medical attention if irritation occurs and persists.

SKIN: Wash with plenty of soap and water. Get medical attention if irritation occurs and persists.

INGESTION: Rinse mouth with water. Dilute by giving 1 or 2 glasses of water. Do not induce vomiting. Never give anything by mouth to an unconscious person. See a medical doctor immediately.

INHALATION: Remove to fresh air. If breathing difficulty or discomfort occurs and persists, contact a medical doctor.

NOTES TO MEDICAL DOCTOR: This product has low oral toxicity and is not irritating to the eyes and skin. Flooding of exposed areas with water is suggested, but gastric lavage or emesis induction for ingestions must consider possible aggravation of esophageal injury and the expected absence of system effects. Treatment is controlled removal of exposure followed by symptomatic and supportive care.

5. FIRE FIGHTING MEASURES

EXTINGUISHING MEDIA: Deluge with water.

FIRE / EXPLOSION HAZARDS: Product is non-combustible. On decomposition releases oxygen which may intensify fire. Presence of water accelerates decomposition.

FIRE FIGHTING PROCEDURES: Do not use carbon dioxide or other gas filled fire extinguishers; they will have no effect on decomposing persulfates. Wear full protective clothing and self-contained breathing apparatus.

FLAMMABLE LIMITS: Non-combustible

SENSITIVITY TO IMPACT: No data available

SENSITIVITY TO STATIC DISCHARGE: Not available

6. ACCIDENTAL RELEASE MEASURES

RELEASE NOTES: Spilled material should be collected and put in approved DOT container and isolated for disposal. Isolated material should be monitored for signs of decomposition (fuming/smoking). If spilled material is wet, dissolve with large quantity of water and dispose as a hazardous waste. All disposals should be carried out according to regulatory agencies procedures.

7. HANDLING AND STORAGE

HANDLING: Use adequate ventilation when transferring product from bags or drums. Wear respiratory protection if ventilation is inadequate or not available. Use eye and skin protection. Use clean plastic or stainless steel scoops only.

STORAGE: Store (unopened) in a cool, clean, dry place away from point sources of heat, e.g. radiant heaters or steam pipes. Use first in, first out storage system. Avoid contamination of opened product. In case of fire or decomposition (fuming/smoking) deluge with plenty of water to control decomposition. For storage, refer to NFPA Bulletin 430 on storage of liquid and solid oxidizing materials.

COMMENTS: VENTILATION: Provide mechanical general and/or local exhaust ventilation to prevent release of dust into work environment. Spills should be collected into suitable containers to prevent dispersion into the air.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

EXPOSURE LIMITS

Chemical Name	ACGIH	OSHA	Supplier
Sodium Persulfate	0.1 mg/m^3 (TWA)		

ENGINEERING CONTROLS: Provide mechanical local general room ventilation to prevent release of dust into the work environment. Remove contaminated clothing immediately and wash before reuse.

PERSONAL PROTECTIVE EQUIPMENT

EYES AND FACE: Use cup type chemical goggles. Full face shield may be used.

RESPIRATORY: Use approved dust respirator when airborne dust is expected.

PROTECTIVE CLOTHING: Normal work clothes. Rubber or neoprene footwear.

GLOVES: Rubber or neoprene gloves. Thoroughly wash the outside of gloves with soap and water prior to removal. Inspect regularly for leaks.

9. PHYSICAL AND CHEMICAL PROPERTIES

ODOR:	None
APPEARANCE:	White crystals
AUTOIGNITION TEMPERATURE:	Not applicable. No evidence of combustion up to 800°C. Decomposition will occur upon heating.
BOILING POINT:	Not applicable
COEFFICIENT OF OIL / WATER:	Not applicable
DENSITY / WEIGHT PER VOLUME:	Not available
EVAPORATION RATE:	Not applicable (Butyl Acetate = 1)
FLASH POINT:	Non-combustible
MELTING POINT:	Decomposes
ODOR THRESHOLD:	Not applicable
OXIDIZING PROPERTIES:	Oxidizer
PERCENT VOLATILE:	Not applicable
pH:	typically 5.0 - 7.0 @ 25 °C (1% solution)
SOLUBILITY IN WATER:	73 % @ 25 °C (by wt.)
SPECIFIC GRAVITY:	2.6 (H_2O=1)
VAPOR DENSITY:	Not applicable (Air = 1)
VAPOR PRESSURE:	Not applicable

10. STABILITY AND REACTIVITY

CONDITIONS TO AVOID:	Heat, moisture and contamination.
STABILITY:	Stable (becomes unstable in presence of heat, moisture and/or contamination).
POLYMERIZATION:	Will not occur
INCOMPATIBLE MATERIALS:	Acids, alkalis, halides (fluorides, chlorides, bromides and iodides), combustible materials, most metals and heavy metals, oxidizable materials, other oxidizers, reducing agents, cleaners, and organic or carbon containing compounds. Contact

with incompatible materials can result in a material decomposition or other uncontrolled reactions.

HAZARDOUS DECOMPOSITION PRODUCTS: Oxygen that supports combustion and oxides of sulfur.

COMMENTS: PRECAUTIONARY STATEMENT: Pumping and transport of Klozür persulfate requires appropriate precautions and design considerations for pressure and thermal relief.

Decomposing persulfates will evolve large volumes of gas and/or vapor, can accelerate exponentially with heat generation, and create significant and hazardous pressures if contained and not properly controlled or mitigated.

Use with alcohols in the presence of water has been demonstrated to generate conditions that require rigorous adherence to process safety methods and standards to prevent escalation to an uncontrolled reaction.

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11. TOXICOLOGICAL INFORMATION

EYE EFFECTS: Non-irritating (rabbit) [FMC Study Number: ICG/T-79.029]

SKIN EFFECTS: Non-irritating (rabbit) [FMC Study Number: ICG/T-79.029]

DERMAL LD_{50}: > 10 g/kg [FMC Study Number: ICG/T-79.029]

ORAL LD_{50}: 895 mg/kg (rat) [FMC Study Number: ICG/T-79.029]

INHALATION LC_{50}: 5.1 mg/l (rat) [FMC I95-2017]

SENSITIZATION: May be sensitizing to allergic persons. [FMC Study Number: ICG/T-79.029]

TARGET ORGANS: Eyes, skin, respiratory passages

ACUTE EFFECTS FROM OVEREXPOSURE: Dust may be harmful and irritating. May be harmful if swallowed.

CHRONIC EFFECTS FROM OVEREXPOSURE: Sensitive persons may develop dermatitis and asthma [Respiration 38:144, 1979]. Groups of male and female rats were fed 0, 300 or 3000 ppm sodium persulfate in the diet for 13 weeks, followed by 5000 ppm for 5 weeks. Microscopic examination of tissues revealed some injury to the gastrointestinal tract at the high dose (3000 ppm) only. This effect is not unexpected for an oxidizer at high concentrations. [Ref. FMC I90-1151, Toxicologist 1:149, 1981].

CARCINOGENICITY:

NTP:	Not listed
IARC:	Not listed
OSHA:	Not listed
OTHER:	ACGIH: Not listed

12. ECOLOGICAL INFORMATION

ECOTOXICOLOGICAL INFORMATION:

Bluegill sunfish, 96-hour LC_{50} = 771 mg/L [FMC Study I92-1250]
Rainbow trout, 96-hour LC_{50} = 163 mg/L [FMC Study I92-1251]
Daphnia, 48-hour LC_{50} = 133 mg/L [FMC Study I92-1252]
Grass shrimp, 96-hour LC_{50} = 519 mg/L [FMC Study I92-1253]

CHEMICAL FATE INFORMATION: Biodegradability does not apply to inorganic substances.

13. DISPOSAL CONSIDERATIONS

DISPOSAL METHOD: Dispose as a hazardous waste in accordance with local, state and federal regulatory agencies.

14. TRANSPORT INFORMATION

U.S. DEPARTMENT OF TRANSPORTATION (DOT)

PROPER SHIPPING NAME:	Sodium Persulfate
PRIMARY HAZARD CLASS / DIVISION:	5.1 (Oxidizer)
UN/NA NUMBER:	UN 1505
PACKING GROUP:	III
LABEL(S):	5.1 (Oxidizer)
PLACARD(S):	5.1 (Oxidizer)
MARKING(S):	Sodium Persulfate, UN 1505
ADDITIONAL INFORMATION:	Hazardous Substance/RQ: Not applicable

49 STCC Number: 4918733

This material is shipped in 225 lb. fiber drums, 55 lb. poly bags and 1000 - 2200 lb. IBC's (supersacks).

INTERNATIONAL MARITIME DANGEROUS GOODS (IMDG)

PROPER SHIPPING NAME: Sodium Persulfate

INTERNATIONAL CIVIL AVIATION ORGANIZATION (ICAO) / INTERNATIONAL AIR TRANSPORT ASSOCIATION (IATA)

PROPER SHIPPING NAME: Sodium Persulfate

OTHER INFORMATION:

Protect from physical damage. Do not store near acids, moisture or heat.

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15. REGULATORY INFORMATION

UNITED STATES

SARA TITLE III (SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT)

SECTION 302 EXTREMELY HAZARDOUS SUBSTANCES (40 CFR 355, APPENDIX A):
Not applicable

SECTION 311 HAZARD CATEGORIES (40 CFR 370):
Fire Hazard, Immediate (Acute) Health Hazard

SECTION 312 THRESHOLD PLANNING QUANTITY (40 CFR 370):
The Threshold Planning Quantity (TPQ) for this product, if treated as a mixture, is 10,000 lbs; however, this product contains the following ingredients with a TPQ of less than 10,000 lbs.:
None

SECTION 313 REPORTABLE INGREDIENTS (40 CFR 372):
Not listed

CERCLA (COMPREHENSIVE ENVIRONMENTAL RESPONSE COMPENSATION AND LIABILITY ACT)

CERCLA DESIGNATION & REPORTABLE QUANTITIES (RQ) (40 CFR 302.4):
Unlisted, RQ = 100 lbs., Ignitability

TSCA (TOXIC SUBSTANCE CONTROL ACT)

TSCA INVENTORY STATUS (40 CFR 710):

Listed

RESOURCE CONSERVATION AND RECOVERY ACT (RCRA)
RCRA IDENTIFICATION OF HAZARDOUS WASTE (40 CFR 261):
Waste Number: D001

CANADA

WHMIS (WORKPLACE HAZARDOUS MATERIALS INFORMATION SYSTEM):

Product Identification Number: 1505
Hazard Classification / Division: Class C (Oxidizer), Class D, Div. 2, Subdiv. B. (Toxic)
Ingredient Disclosure List: Listed

INTERNATIONAL LISTINGS

Sodium persulfate:
Australia (AICS): Listed
China: Listed
Japan (ENCS): (1)-1131
Korea: KE-12369
Philippines (PICCS): Listed

HAZARD, RISK AND SAFETY PHRASE DESCRIPTIONS:

EC Symbols: (Not classified as hazardous)

EC Risk Phrases: (Not classified as hazardous)

EC Safety Phrases: (Not classified as hazardous)

16. OTHER INFORMATION

HMIS

Health	1
Flammability	0
Physical Hazard	1
Personal Protection (PPE)	J

Protection = J (Safety goggles, gloves, apron & combination dust & vapor respirator)

HMIS = Hazardous Materials Identification System

Degree of Hazard Code:
4 = Severe

3 = Serious
2 = Moderate
1 = Slight
0 = Minimal

NFPA

Health	1
Flammability	0
Reactivity	1
Special	OX

SPECIAL = OX (Oxidizer)

NFPA = National Fire Protection Association

Degree of Hazard Code:
4 = Extreme
3 = High
2 = Moderate
1 = Slight
0 = Insignificant

REVISION SUMMARY:
New MSDS

Klozür and FMC Logo - FMC Trademarks

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MSDS for PermeOx® Plus

MATERIAL SAFETY DATA SHEET

PermeOx® Plus

MSDS Ref. No.: 1305-79-9-2
Date Approved: 01/20/2005
Revision No.: 13

This document has been prepared to meet the requirements of the U.S. OSHA Hazard Communication Standard, 29 CFR 1910.1200; the Canada's Workplace Hazardous Materials Information System (WHMIS) and, the EC Directive, 2001/58/EC.

1. PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: PermeOx® Plus

SYNONYMS: PermeOx-Solid Peroxygen, Calcium Superoxide, Calcium Peroxide

GENERAL USE: Permeox is a solid peroxygen chemical designed for environmental applications. The product provides controlled release of oxygen in-situ which permeates throughout the substrate.

MANUFACTURER

FMC CORPORATION
Active Oxidants Division
1735 Market Street
Philadelphia, PA 19103
(866) 860-4760 (General Information)

EMERGENCY TELEPHONE NUMBERS

(800) 424-9300 (CHEMTREC - U.S.)
(303) 595-9048 (Medical - Call Collect)

(716) 879-0400 (Plant/Other)

2. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW:

- Odorless, off-white fine granular solid.
- Oxidizer.
- Contact with combustibles may cause fire.
- Under fire conditions product may decompose releasing oxygen that intensifies fire.
- Deluge container with water at safe distance or in protected area.
- Severely irritating to the eyes.

POTENTIAL HEALTH EFFECTS: Airborne dust may be irritating to eyes, nose, throat and lungs. No significant long term inhalation hazard; irritation usually subsides after exposure ceases.

3. COMPOSITION / INFORMATION ON INGREDIENTS

Chemical Name	CAS#	Wt.%	EC No.	EC Class
Calcium Peroxide	1305-79-9	>75	215-139-4	Not classified as hazardous
Calcium Hydroxide	1305-62-0	<25	215-137-3	Not classified as hazardous

4. FIRST AID MEASURES

EYES: Immediately flush with water for at least 15 minutes, lifting the upper and lower eyelids intermittently. See a medical doctor or ophthalmologist immediately.

SKIN: Wash with plenty of soap and water. Get medical attention if irritation occurs and persists.

INGESTION: Rinse mouth with water. Dilute by giving 1 or 2 glasses of water. Do not induce vomiting. Never give anything by mouth to an unconscious person. See a medical doctor immediately.

INHALATION: Remove to fresh air. If breathing difficulty or discomfort occurs and persists, obtain medical attention.

NOTES TO MEDICAL DOCTOR: Modest irritation is the only expected effect, and should have no serious consequences except perhaps in the case of direct eye contact. Contaminated external surfaces should be flooded with water, and direct eye contact deserves ophthalmologic evaluation. If ingested, gastrointestinal irritation but not caustic burns are to be expected; dilution with water indicated as may be gastric evacuation via emesis or lavage if large doses or severe irritation is evident. Demulcents should be helpful. No systemic effects are expected though human toxicity data is sparse.

5. FIRE FIGHTING MEASURES

EXTINGUISHING MEDIA: Deluge with plenty of water.

FIRE / EXPLOSION HAZARDS: Under fire conditions may decompose and release oxygen gas. Mixtures with polysulfide polymers may ignite.

FIRE FIGHTING PROCEDURES: Use flooding quantities of water. Use water spray to keep fire exposed containers cool.

FLAMMABLE LIMITS: Non-combustible

SENSITIVITY TO IMPACT: Oxidizable materials can be ignited by grinding and may become explosive.

SENSITIVITY TO STATIC DISCHARGE: Not available

6. ACCIDENTAL RELEASE MEASURES

RELEASE NOTES: Confine spill and place into container; dilute with a large quantity of water for disposal. Do not return product to the original container. Runoff to sewer may create fire or explosion hazard (do not flush powdered material to sewer).

7. HANDLING AND STORAGE

HANDLING: Avoid contact by using personal protective equipment. Use respiratory protective equipment when release of airborne dust is expected. If compounded with organics or combustible materials be sure to exclude moisture.

STORAGE: Keep material dry. Store in a clean cool place. Do not store near or expose to heat sources i.e., steam pipes, radiant heaters, hot hair vents or welding sparks. Avoid contact with reducing agents. Reacts with moisture. Keep container tightly closed when not in use.

COMMENTS: VENTILATION: Provide mechanical general and/or local exhaust ventilation to prevent release of dust into work environment. If ventilation is inadequate or not available, use dust respirator and eye protection.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

EXPOSURE LIMITS

Chemical Name	ACGIH	OSHA	Supplier
Calcium Hydroxide	5 mg/m^3 (TWA)	5 mg/m^3 (TWA)	5 mg/m^3 (TWA)

ENGINEERING CONTROLS: Provide mechanical local exhaust ventilation to prevent release of dust into the work area. If release is expected use respiratory protection.

PERSONAL PROTECTIVE EQUIPMENT

EYES AND FACE: Chemical goggles or face shield.

RESPIRATORY: Use approved dust respirator with full face piece.

PROTECTIVE CLOTHING: Long sleeve shirt, impervious apron or clothing. Rubber or neoprene footwear.

GLOVES: Rubber or neoprene gloves. Thoroughly wash the outside of gloves with soap and water prior to removal. Inspect regularly for leaks.

9. PHYSICAL AND CHEMICAL PROPERTIES

ODOR:	None
APPEARANCE:	Off-white fine granular solid
AUTOIGNITION TEMPERATURE:	Non-combustible
BOILING POINT:	No data available
COEFFICIENT OF OIL / WATER:	Not available
DENSITY / WEIGHT PER VOLUME:	Approximately 27 lb/ft^3
EVAPORATION RATE:	Not applicable (Butyl Acetate = 1)
FLASH POINT:	Not applicable
MELTING POINT:	Decomposes on heating (About 275°C)
ODOR THRESHOLD:	Not available
OXIDIZING PROPERTIES:	Oxidizer
PERCENT VOLATILE:	Not applicable
pH:	(1% solution) @ 25°C: Slurry 10.5 - 11.8
SOLUBILITY IN WATER:	Slightly soluble
SPECIFIC GRAVITY:	Approximately 2.92 (H_2O=1)
VAPOR DENSITY:	Not applicable (Air = 1)
VAPOR PRESSURE:	Not applicable

10. STABILITY AND REACTIVITY

CONDITIONS TO AVOID:	Heat (decomposes at 275°C), moisture, reducing agents. Grinding with organics.
STABILITY:	Stable (decomposition could occur when exposed to heat or moisture)
POLYMERIZATION:	Will not occur
INCOMPATIBLE MATERIALS:	Grinding mixtures with organics (oxidizable materials can be ignited by grinding and may become explosive); heavy metals.

HAZARDOUS DECOMPOSITION PRODUCTS: Oxygen that supports combustion and calcium hydroxide.

11. TOXICOLOGICAL INFORMATION

EYE EFFECTS: Severely irritating to unwashed eyes.
Minimally irritating to washed eyes. (rabbit) [Ref. FMC I88-1053]

SKIN EFFECTS: Non-irritating (rabbit) [Ref. FMC I88-1054]

DERMAL LD_{50}: > 10 g/kg (rat) [FMC Study Number: ICG/T-79.026]

ORAL LD_{50}: > 5 g/kg (rat) [Ref. FMC I88-1052]

INHALATION LC_{50}: > 17 mg/l (1 h) (rat) [Ref. FMC ICG/T-79.026]

TARGET ORGANS: Eyes and respiratory passages

ACUTE EFFECTS FROM OVEREXPOSURE: Dust is irritating to eyes, nose, throat, and lungs.

CHRONIC EFFECTS FROM OVEREXPOSURE: No data available for the product.

CARCINOGENICITY:

NTP:	Not listed
IARC:	Not listed
OSHA:	Not listed
OTHER:	ACGIH: Not listed

12. ECOLOGICAL INFORMATION

ECOTOXICOLOGICAL INFORMATION: Effect of low concentrations on aquatic life are unknown.
[Ref. NIOSH RTECS No. 79-100]

CHEMICAL FATE INFORMATION: As indicated by chemical properties oxygen is released into the environment.

13. DISPOSAL CONSIDERATIONS

DISPOSAL METHOD: Dissolve in water to allow the release of oxygen and dispose via a treatment system in accordance with governmental agencies regulations. Contact appropriate regulatory agency prior to disposal.

14. TRANSPORT INFORMATION

U.S. DEPARTMENT OF TRANSPORTATION (DOT)

PROPER SHIPPING NAME:	Calcium Peroxide
PRIMARY HAZARD CLASS / DIVISION:	5.1 (Oxidizer)
UN/NA NUMBER:	UN 1457
PACKING GROUP:	II
LABEL(S):	5.1 (Oxidizer)
PLACARD(S):	5.1 (Oxidizer)
ADDITIONAL INFORMATION:	DOT Marking: Oxidizing solid, n.o.s. (calcium peroxide), UN 1457 Hazardous Substance/RQ: Not applicable 49 STCC Number: 49187717 This material is shipped in 25 lb. plastic pails, and 30 lb. and 100 lb. fiber drums.

INTERNATIONAL MARITIME DANGEROUS GOODS (IMDG)

PROPER SHIPPING NAME:	Calcium Peroxide

INTERNATIONAL CIVIL AVIATION ORGANIZATION (ICAO) / INTERNATIONAL AIR TRANSPORT ASSOCIATION (IATA)

PROPER SHIPPING NAME:	Calcium Peroxide

OTHER INFORMATION:

Place spilled product in suitable container and wash residue with plenty of water.

15. REGULATORY INFORMATION

UNITED STATES

SARA TITLE III (SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT)

SECTION 311 HAZARD CATEGORIES (40 CFR 370):
Fire Hazard, Immediate (Acute) Health Hazard

SECTION 312 THRESHOLD PLANNING QUANTITY (40 CFR 370):
The Threshold Planning Quantity (TPQ) for this product, if treated as a mixture, is 10,000 lbs; however, this product contains the following ingredients with a TPQ of less than 10,000 lbs.:
None

SECTION 313 REPORTABLE INGREDIENTS (40 CFR 372):
Not listed

CERCLA (COMPREHENSIVE ENVIRONMENTAL RESPONSE COMPENSATION AND LIABILITY ACT)

CERCLA DESIGNATION & REPORTABLE QUANTITIES (RQ) (40 CFR 302.4):
Not applicable

TSCA (TOXIC SUBSTANCE CONTROL ACT)

TSCA INVENTORY STATUS (40 CFR 710):
Listed

RESOURCE CONSERVATION AND RECOVERY ACT (RCRA)

RCRA IDENTIFICATION OF HAZARDOUS WASTE (40 CFR 261):
Waste Number: Calcium Peroxide, D001

CANADA

WHMIS (WORKPLACE HAZARDOUS MATERIALS INFORMATION SYSTEM):

Chemical Name:	Calcium hydroxide
Product Identification Number:	1457
Hazard Classification / Division:	Class D, Div 2, Subdiv. B, Class C (Oxidizer)
Ingredient Disclosure List:	Listed

INTERNATIONAL LISTINGS

Calcium peroxide:
Australia (AICS): Listed
China: Listed
Japan (ENCS): (1)-190
Korea: KE-04597
Philippines (PICCS): Listed

Calcium hydroxide:
Australia (AICS): Listed
China: Listed
Japan (ENCS): (1)-181

Korea: KE-04518
Philippines (PICCS): Listed

16. OTHER INFORMATION

HMIS

Health	2
Flammability	0
Physical Hazard	1
Personal Protection (PPE)	J

Protection = J (Safety goggles, gloves, apron & combination dust & vapor respirator)

HMIS = Hazardous Materials Identification System

Degree of Hazard Code:
4 = Severe
3 = Serious
2 = Moderate
1 = Slight
0 = Minimal

NFPA

Health	2
Flammability	0
Reactivity	1
Special	OX

SPECIAL = OX (Oxidizer)

NFPA = National Fire Protection Association

Degree of Hazard Code:
4 = Extreme
3 = High
2 = Moderate
1 = Slight
0 = Insignificant

REVISION SUMMARY:
This MSDS replaces Revision #12, dated January 29, 2004.
Changes in information are as follows:
Section 14 (Transport Information)
Section 16 (Other Information)

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