

Modification Application for Risk Reduction Activities Otay Landfill

Otay Landfill, Inc.
1700 Maxwell Road
Chula Vista, California 91911
619-421-3773

SCS ENGINEERS

01205144.22 | October 2021

4683 Chabot Drive, Suite 200
Pleasanton, CA 94588

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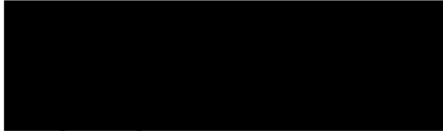
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This document is dated October 2021 and was prepared and reviewed by the following:



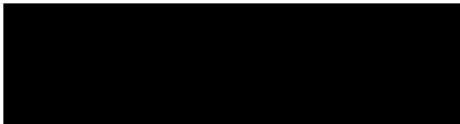
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1.0 INTRODUCTION

1.1 OVERVIEW

This application, prepared by SCS Engineers (SCS), on behalf of Otay Landfill, Inc. (OLI) details the risk reduction activities that will be implemented at the Otay Landfill (Otay or landfill) to reduce health risk. This document serves as both a modification application to have these risk reduction activities permitted, as well as serving as the risk reduction audit and plan (RRAP) detailed in San Diego Air Pollution Control District (SDAPCD or District) Rule 1210 (e).

SDAPCD Rule 1210 (e) reads as follows:*(1) Except as provided in Subsections (e)(2), (e)(3) and (e)(4), within six months of receipt of written notice from the Air Pollution Control Officer that a stationary source's most recent approved public health risk assessment indicates potential public health risks equal to or greater than one or more of the following significant risk mitigation levels, the owner or operator shall submit to the Air Pollution Control Officer, for review for completeness, a stationary source toxic air contaminant risk reduction audit and plan:*

(i) Maximum incremental cancer risks equal to or greater than 100 in one million, or

(ii) Cancer burden equal to or greater than 1.0, or

(iii) Total acute noncancer health hazard index equal to or greater than 1.0, or

(iv) Total chronic noncancer health hazard index equal to or greater than 1.0.

The risk reduction audit and plan shall contain airborne toxic risk reduction measures proposed by the owner or operator which will be sufficient to reduce the stationary source emissions to levels that result in potential public health risks below the significant risk mitigation levels specified above. Such emission reductions shall be accomplished within five years of the date the plan is submitted to the Air Pollution Control Officer.

(5) The risk reduction audit and plan submitted by the owner or operator shall contain all of the following:

(i) The name, location and standard industrial classification (SIC) code of the stationary source.

(ii) The identification of the emission units and toxic air contaminants emitted by each emission unit that contribute to potential public health risks above the significant risk mitigation levels specified in Subsection (e)(1). Emission units shall be listed by decreasing contribution to the total potential public health risks estimated for the stationary source. Toxic air contaminants shall be listed for each emission unit by decreasing contribution to the potential public health risk estimated for that unit.

The plan need not include identification of emission units which emit toxic air contaminants in amounts which the approved public health risk assessment indicates Regulation XII -14- Rule 1210 do not cause maximum incremental cancer risks greater than 1.0 in a million, nor a total acute noncancer health hazard index of 1.0 or greater, nor a total chronic

noncancer health hazard index of 1.0 or greater. The plan shall include identification of all emission units for which the owner or operator proposes to reduce toxic air contaminant emissions as part of the risk reduction audit and plan.

1.2 BACKGROUND INFORMATION

1.2.1 Applicant Name and Address

Otay Landfill, Inc.
1700 Maxwell Road
Chula Vista, CA 91911

1.2.2 Facility Address

Otay Landfill
1700 Maxwell Road
Chula Vista, CA 91911

1.2.3 Nature of Business

Municipal Solid Waste Landfill

1.2.4 Persons to Contact Regarding Application

Marco Cervantes
Environmental Manager
Otay Landfill, Inc.
1700 Maxwell Road
Chula Vista, CA 91911
(619) 332-9021

Mr. Patrick Sullivan
Senior Vice President
SCS Engineers
3117 Fite Circle, Suite 108
Sacramento, California 95827
(916) 503-2956

1.2.5 Operation Schedule

11 hours per day
6 days per week
52 weeks per year

1.2.6 Status of Application

This is a modification application for risk reduction activities.

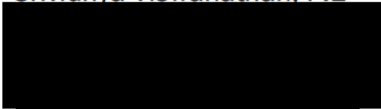
1.2.7 Facility Status

Existing facility

1.2.8 Compliance Certification

A certification is required for this RRAP by a professional engineer or environmental assessor registered in California. The certification must be from an individual responsible for the processes or operations at the landfill.

"I, Srividhya Viswanathan, certify that this audit and plan meets the requirements of Rule 1210(e) and Part 6, Chapter 6 of Division 26 of the California Health and Safety (H&S) Code. OLI also certifies that all facilities owned or operated by OLI are in compliance or on approved schedule for compliance with applicable federal, state, and local emission limits and standards."

Certified by: Srividhya Viswanathan, P.E. _____
Signature:  _____
Date: 10-21-21 _____

A copy of the completed SDAPCD permit application form and fee estimate for the RRAP is provided as **Appendix A** to this report. Please note that per direction of SDAPCD via email on October 19, 2021, the fee estimate for Sycamore Landfill can be used for this application.

2.0 PROJECT DESCRIPTION

2.1 EXISTING OPERATION

Otay is located in Chula Vista, California. The Site is owned and operated by OLI. The primary function of Otay is for the disposal of municipal solid waste (MSW) (Standard Industrial Code (SIC) #4953). The landfill is equipped with a landfill gas (LFG) collection and control system (GCCS), the original objective of which was to control the migration of combustible gases to off-site soils (California Code of Regulations [CCR] Title 27). However, over time, the GCCS has been expanded and enhanced to comply with federal, state, and local air quality regulations.

The OLI GCCS consists of vertical and horizontal extraction wells used to collect the LFG, a high-density polyethylene (HDPE) piping collection system used to convey the collected LFG, and a blower/flare station (BFS) used to destruct the collected LFG. The BFS consists of a John Zink flare (No. 1) rated at 150 Million British Thermal Unit per hour (MMBtu/hr) and a Perennial flare (No. 2) rated at 48 MMBtu/hr.

2.2 REASON FOR PERMITTING ACTION

OLI received notice from the SDAPCD that the 2013 health risk assessment (HRA) indicated that public risk was above the significant risk mitigation levels under Rule 1210. This requires OLI to submit a RRAP within six months. This document will define risk reduction measures that can be implemented into the facility's air permit (APCD2009-PTO-971112).

3.0 RISK REDUCTION

Otay contains the following emission units that contribute to public health risks above the significant mitigation levels:

- Landfill (area source)
- Diesel engines (point source)
- Flares (point sources)
- Stockpiles
- Unpaved and paved haul roads (line volume sources)

3.1 RISK CONTRIBUTION

As required by the California H&S code, section 44360, the District requested a Health Risk Assessment (HRA) on July 5, 2016 for the 2013 calendar year. OLI submitted an HRA to the District on December 29, 2016. The District provided a draft revised 2013 emission inventory, comments on the HRA, and comments provided from the Office of Environmental Health Hazard Assessment (OEHHA) to Otay Landfill on October 13, 2017. Subsequently, the District revised and approved the HRA on November 9, 2020 considering the comments provided by OEHHA. Based upon additional comments provided to the District by OLI on February 17, 2021, the District revised the emission calculations and updated the HRA. On March 4, 2021, the District provided the revised emissions calculations and updated HRA to OLI, and allowed for submittal of comments or a modified HRA meeting District requirements. After considering the comments provided by OLI on April 19, 2021, the District approved the 2013 HRA.

According to the 2013 HRA, specific contaminants that contribute the most to overall health risk are arsenic and crystalline silica, and to a lesser extent, vinyl chloride, dichlorobenzene, and benzene. By far, the largest contributors to total risk are non-volatile minerals and metals being released in particulate matter (PM), which is present in fugitive dust emitted from the landfill (i.e. unpaved haul roads, stockpiles, etc.). These metals and minerals are naturally occurring in the soils present at Otay. The RRAP is required due to cancer risk exceeding ten in one million and acute as well as chronic risks in excess of a hazard index (HI) of 1.0. Therefore, sources and TACs contributing to the risk will be the focus of this RRAP.

3.2 RISK REDUCTION EVALUATION

The largest contribution to health risk for Otay are minerals and metals present in PM being emitted on unpaved haul roads and stockpiles, specifically arsenic, crystalline silica, and lead. The industry standard for reducing PM emissions from these emission units is by providing a routine watering schedule to all haul roads and stockpiles at Otay, and depositing chemical dust suppressants on haul roads.

OLI has been following a regimented watering schedule to reduce this health risk since 2013. Local dirt-surfaced access roads to the active disposal area and other locations at the Otay Landfill are treated by applying a fine water spray when conditions favor the formation of fugitive dust. Unless visually wet, the application will be made at a minimum of every 4 hours during operating hours. Dust is also controlled by:

1. applying a fine water spray on soil cover in work areas when conditions may generate fugitive dust,

2. applying water and planting temporary vegetative cover when possible on the intermediate soil cover where wind-blown dust may be generated,
3. applying water with a chemical dust suppressant additive, and
4. vegetation of the completed landfill slopes.

OLI has selected Roadsaver-C as its preferred chemical dust suppressant. It is an odorless and colorless brine solution that can be used as a cost-effective dust palliative and road stabilizer. OLI currently purchases Roadsaver-C and has continuously used the product twice per year during the drier months of the year (typically in May and September). In the future, OLI will apply the chemical dust suppressant at a minimum twice per year, but up to quarterly. The safety data sheet (SDS) and information on calcium chloride are available in **Appendix B**. Dust palliatives/stabilizers reduce the silt content of surface material on the roads, thus decreasing fugitive dust release. Roadways will be maintained per Enviro Tech's recommendations for maximizing efficiency of Roadsaver-C, which includes the following:

1. The road surface should be bladed to eliminate all washboards and potholes.
2. Once the washboard and potholes are eliminated, the road surface should be shaped for proper drainage.
3. The surface be pre-wet with water before the dust control product is applied. The water helps break the surface tension of the road so the product can penetrate the top 1/4" of the surface. In addition, because calcium chloride is hygroscopic, it will naturally want to find moisture. Therefore, it is best to have moisture in the road. Pre-wet application rates depends on the current moisture in the road. If the road base already has significant moisture, the water application can be as little as 0.25 gallons per square yard. If the road base is dry, the application rate can be 0.5 gallons per square yard. The goal is to have enough moisture on the road without causing puddles.
4. The dust control product (RoadSaver-C) application is based on industry standards, 0.5 gallons per square yard. Application is typically made in two passes at 0.25 gallons per square yard per pass for a total of 0.5 gallons per square yard. Enviro Tech's trucks are equipped with computerized spray systems that help our applicators to accurately apply our products.

Additional risk reduction actions that could hypothetically suppress dust would include paving all roadways, and containing stockpiles inside buildings with baghouses. These actions are infeasible as well as not economically viable. OLI has paved all permanent roads around the facility. Since the location where waste is being deposited daily is constantly changing, it is not reasonable to pave these temporary roads. Stockpiles also move frequently, so installing a building to contain them is not feasible, and would be extremely expensive.

3.3 RISK REDUCTION SCHEDULE

These risk reduction activities are currently being used on-site and will continue for the foreseeable future to suppress dust.

3.4 RISK REDUCTION DEMONSTRATION

When SDAPCD calculated the dust emissions for OLI’s 2013 HRA, a standard APCD control efficiency of 80% was most likely used for watering. With the addition of a more regimented watering schedule and use of chemical dust suppressants, an 80% control efficiency was still used based on APCD defaults. However, OLI requests that APCD review the updated risk reduction schedule in Section 3.3 and assess if a higher control efficiency is warranted for HRAs starting with the 2017 evaluation. We believe the higher control efficiency afforded by the improved watering schedule and use of a soil stabilizer will create the emission reductions necessary to reduce risk.

The 2017 HRA for OLI was submitted in April 2021. Although this HRA is still in review, the results of this assessment show a drastic decrease in particulate emissions, and thus health risk in general. This is due in part to risk reduction activities including continuing to limit haul road speeds at the landfill, haul road and stockpile watering, and use of chemical dust suppressants. **Table 1** below shows the reduction in health risk between the two HRAs.

Table 1. HRA Comparison

Risk Type	2013 HRA	2017 HRA	Units
Cancer Maximum*	141.97	31.4	Cancer Risk Per Million
Cancer Maximum Residential	32.95	7.60	Cancer Risk Per Million
Cancer Maximum Worker	3.76	1.82	Cancer Risk Per Million
Chronic Maximum*	9.40	1.70	Hazard Index (HI)
Chronic Maximum Residential	2.09	0.50	Hazard Index (HI)
Chronic Maximum Worker	2.76	0.64	Hazard Index (HI)
Acute Maximum*	0.91	1.77	Hazard Index (HI)
Acute Maximum Residential	0.37	0.72	Hazard Index (HI)
Acute Maximum Worker	0.77	0.84	Hazard Index (HI)
Cancer Burden	0.62	0.10	Cumulative Cancer Risk Multiplied by Population

*No actual receptor present at this location

The significant risk mitigation levels for OLI are the following:

- Maximum incremental cancer risks equal to or greater than 100 in one million
- Total chronic noncancer health hazard index equal to or greater than 1.0

For 2013, Otay emissions caused an exceedance of:

1. Cancer risk at maximum point, and

2. Chronic risk at maximum, residential and worker.

In 2017, Otay emissions caused an exceedance of:

1. Chronic risk at maximum point, and
2. Acute risk at maximum point.

It is clear that the reduction in emissions between 2013 and 2017 also reduced the risk below the significant risk mitigation levels. No residential, worker, or sensitive receptor was over these levels in 2017, only the maximum points were exceeded for chronic and acute. These maximum points are located directly on the property boundary where people are not expected to be for any significant timeframe, if at all.


This recently submitted HRA should serve as demonstration that the risk reduction measures since 2013 have worked and will only improve if SDAPCD agrees to a higher control efficiency, and considers other revisions to methodologies proposed by OLI.

3.5 PROGRESS REPORTS

Rule 1210(e) requires progress reports to be submitted at least annually under this RRAP. OLI will provide progress reports as required on an annual basis incorporated into the toxic air contaminant emission inventory report. This report will detail actions taken by OLI to reduce TAC emissions and the estimated public health risk reduction achieved.

4.0 CONCLUSION

OLI has included all required information from Rule 1210(e) regarding the RRAP. The risk reduction activities detailed in this permit modification application serve to update the current permit and show that OLI is taking all necessary steps to reduce health risk at the landfill. From 2013 through 2017, OLI has taken numerous steps to reduce overall health risk as is evident in the HRA results from each year.



Appendix A

General Permit Application Form and Fee Estimate

Internal Use Only	
APP ID: APCD	-APP/CER-
SITE ID: APCD	-SITE-

**GENERAL PERMIT OR
REGISTRATION
APPLICATION FORM**



Submittal of this application does not grant permission to construct or to operate equipment except as specified in Rule 24(c).

REASON FOR SUBMITTAL OF APPLICATION:

- | | | |
|--|---|--|
| <input type="checkbox"/> New Installation | <input type="checkbox"/> Existing Unpermitted Equipment or Rule 11 Change | <input type="checkbox"/> Modification of Existing Permitted Equipment |
| <input type="checkbox"/> Amendment to Existing Authority to Construct or Application | <input type="checkbox"/> Change of Equipment Location | <input type="checkbox"/> Change of Equipment Ownership (please provide proof of ownership) |
| <input checked="" type="checkbox"/> Change of Permit Conditions | <input type="checkbox"/> Change Permit to Operate Status to Inactive | <input type="checkbox"/> Banking Emissions |
| <input type="checkbox"/> Registration of Portable Equipment | <input type="checkbox"/> Other (Specify) _____ | |

List affected APP/PTO Record ID(s): APCD2009-PTO-971112

APPLICANT INFORMATION

Name of Business (DBA) Otay Landfill, Inc.

Does this organization own or operate any other APCD permitted equipment at this or any other adjacent locations? Yes No

If yes, list assigned Site Record IDs listed on your Permits

Name of Legal Owner (if different from DBA)

Equipment Owner	Authority to Construct Mailing Address
Name: Otay Landfill, Inc.	Name: Same as Equipment Owner
Mailing Address: 1700 Maxwell Road	Mailing Address:
City: Chula Vista State: CA Zip: 91911	City: State: Zip:
Phone: (619) 421-5192	Phone: ()
E-Mail Address: nmohr@republicservices.com	E-Mail Address:

Permit To Operate Mailing Address	Invoice Mailing Address
Name: Same as Equipment Owner	Name: Same as Equipment Owner
Mailing Address:	Mailing Address:
City: State: Zip:	City: State: Zip:
Phone: ()	Phone: ()
E-Mail Address:	E-Mail Address:

EQUIPMENT/PROCESS INFORMATION: Type of Equipment: Stationary Portable, if portable please enter below the equipment storage address. If portable, will operation exceed 12 consecutive months at the same location Yes No

Equipment Location Address 1700 Maxwell Road City: Chula Vista State: CA

Parcel No. _____ Zip 91911 Phone (619) 332-9021 E-mail: mcervantes2@republicservices.com

Site Contact Marco Cervantes Phone (619) 332-9021

General Description of Equipment/Process Municipal Solid Waste Landfill

Application Submitted by Owner Operator Contractor Consultant Affiliation SCS Engineers

EXPEDITED APPLICATION PROCESSING: I hereby request Expedited Application Processing and understand that:

- a) Expedited processing will incur additional fees and permits will not be issued until the additional fees are paid in full (see Rule 40(d)(8)(iv) for details) b) Expedited processing is contingent on the availability of qualified staff c) Once engineering review has begun this request cannot be cancelled d) Expedited processing does not guarantee a specific date nor does it guarantee permit approval.

I hereby certify that the information provided on this application is true and correct.

SIGNATURE: _____ Date: 10/21/21
 Print Name Neil Mohr Company Otay Landfill, Inc.
 Phone (619) 733-7525 E-mail Address nmohr@republicservices.com

Internal Use Only

Internal Use Only	
APP ID: APCD	-APP/CER-
SITE ID: APCD	-SITE-

**GENERAL PERMIT OR
REGISTRATION
APPLICATION FORM**



Date _____	Staff Initials: _____	Amt Rec'd \$ _____	Fee Schedule _____
RNP: _____	EMF: _____	NBF: _____	TA: _____

GEN_APP_Form_Rev Date: Aug. 2017

**SAN DIEGO COUNTY AIR POLLUTION CONTROL DISTRICT
APPLICATION FEE ESTIMATE**

Applicant Site ID/PTO Number:	APCD2009-PTO-971227	NA
Applicant DBA:	Otay Landfill	Fee Schedule: JOB
		Reason for Submittal: Risk reduction
		Existing Site? Yes
APCD Engineer:	Michelle Giron	Estimate Date: 4/27/2021
Equipment Description:	Landfill Hot Spots risk reduction plan (APCD2020-HRA-0013)	

ACTIVITY	EMPLOYEE CLASSIFICATION	LABOR HOURS	COST	SUBTOTAL
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Initial Evaluation Fee - T&M (Rule 40(d)(3)(i))

Authority to Construct	Project Engineer		\$0.00	\$0.00	ETM
	Senior Engineer		\$0.00		
Permit to Operate	Project Engineer	35.0	\$5,985.00	\$8,055.00	ETM
	Senior Engineer	10.0	\$2,070.00		

T&M Application - No Fixed Fee, see above

Authority to Construct/Permit to Operate	N/A	T+M	\$0.00	ETM
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Additional Evaluation and Processing Fees (Rule 40(d)(5))

New Source Review	Project Engineer		\$0.00	\$0.00	NSR AQI
	Meteorologist		\$0.00		
Prev. Significant Deterioration	Project Engineer		\$0.00	\$0.00	PSD
Rule 1210 Risk Analysis (Health Risk Assessment)	Project Engineer		\$0.00	\$1,844.00	
	Meteorologist		\$0.00		
	Air Resources Specialist		\$0.00		
	HRA Base Estimate	Standard	\$1,844.00		
Title V	Project Engineer		\$0.00	\$0.00	TIV
	Senior Engineer		\$0.00		
NESHAPS/ATCM/NSPS	Project Engineer		\$0.00	\$0.00	HAP
CEQA	Project Engineer		\$0.00	\$0.00	CEQ
AB 3205 Notice	Project Engineer		\$0.00	\$0.00	AB3
	Public Notice Costs		\$0.00		
Equipment subject to Rule 11(a)(3)	Project Engineer		\$0.00	\$0.00	R51
	Senior Engineer		\$0.00		
H&SC 42301(e)	Project Engineer		\$0.00	\$0.00	HSC
	Senior Engineer		\$0.00		
Testing or Test Witness	Project Engineer		\$0.00	\$0.00	STF ad-hoc ad-hoc ad-hoc ad-hoc
	Senior Chemist		\$0.00		
	Associate Chemist		\$0.00		
	Source Test Technician		\$0.00		
Fixed Test Fee Sched.	NA	Fixed Testing Fees	\$0.00	\$0.00	

Miscellaneous Fees

Processing Fee (Rule 40(d)(1)(ii))	1.0	\$74	\$74.00	EFX
Renewal Fee (Rule 40(e)(2)(ii))	N/A	N/A	\$0.00	REN
Emissions Fee (Rule 40(e)(2)(iv))		N/A	\$0.00	EMF

NOTES:

ESTIMATE TOTAL: **\$9,973.00**

- To avoid possible processing delays, this document should be submitted with your application forms.
- The fees contained in this estimate are based on APCD Rule 40. Final fee may be more or less than this estimate (see Rule 40(d)(1)(iii)).
- Emissions determined to be greater than 5 tons per year will be charged a emission fee on a ton per year basis. (see Rule 40 (e)(2)(iv)(A))
- Fees paid by credit card will be assessed a 2.2% processing fee (see Rule 40(c)(5))
- Federal government payments made through DFAS: Please reference the above listed Site ID Record number in your DFAS submittal.
- This estimate is valid only for applications received by the District by June 30, 2019

Appendix B

Road Saver- C Safety Data Sheet and Manufacturer's Information



1. PRODUCT AND COMPANY IDENTIFICATION

Product Identity: Roadsaver®-C

Recommended use of the chemical and restrictions on use: Road stabilization, dust control and de-icing

Manufacturer: EnviroTech Services, Inc.
910 54th Ave, Suite 230
Greeley, CO 80634

Telephone: (970) 346-3900

Emergency Phone: CHEMTREC: (800) 424-9300

SDS Date of Preparation: 4/23/2015

2. HAZARDS IDENTIFICATION

GHS Classification:

Physical	Health	Environment
Not Hazardous	Not Hazardous	Not Hazardous

GHS Label Elements:



Warning!

Causes serious eye irritation.

Wash thoroughly after handling.

Wear eye and face protection.

IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do.

Continue rinsing.

If eye irritation persists: Get medical attention.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Component	CAS No.	Amount
Water	7732-18-5	60-75%
Calcium Chloride	10043-52-4	25-40%

The exact concentration is determined according to customer request.

4. FIRST AID MEASURES

Eye: Flush victim's eyes with large quantities of water, while holding the eyelids apart. Get medical attention if irritation occurs and persists.

Skin: Wash skin thoroughly with soap and water. Get medical attention if irritation develops. Remove and launder clothing before reuse.

Ingestion: Do not induce vomiting. Rinse mouth with water and give one glass of water to drink. Never give anything by mouth to an unconscious or convulsing person. Get medical attention if symptoms develop.

Inhalation: Remove victim to fresh air. If breathing is difficult or irritation persists, get medical attention.

Most important Symptoms: May cause slight eye and skin irritation.

Indication of immediate medical attention/special treatment: Immediate medical attention is not required.

5. FIRE FIGHTING MEASURES

Suitable (and Unsuitable) Extinguishing Media: Use media appropriate for surrounding fire. Cool fire exposed containers and structures with water.

Specific hazards arising from the chemical: Thermal decomposition may yield hydrogen chloride, halogenated compounds, and chlorine gas.

Special Protective Equipment and Precautions for Fire-Fighting Instructions: Firefighters should wear positive pressure self-contained breathing apparatus and full protective clothing. Aqueous solutions may cause surfaces to be extremely slippery and cause a slip hazard.

6. ACCIDENTAL RELEASE MEASURES

Personal Precautions, Protective Equipment, and Emergency Procedures: Wear appropriate protective clothing as described in Section 8. Wash thoroughly after handling.

Methods and Materials for Containment and Cleaning Up: Dike and collect liquid or absorb with an inert absorbent and place in appropriate containers for disposal. Flush spill area with water. Report releases as required by local, state, and federal authorities.

7. HANDLING AND STORAGE

Precautions for Safe Handling: Avoid contact with the eyes, skin, and clothing. Avoid breathing mists or aerosols. Wear protective clothing and equipment as described in Section 8. Wash thoroughly with soap and water after handling. Keep containers closed when not in use.

Conditions for Safe Storage, Including Any Incompatibilities: Store in a cool, dry, well-ventilated area away from incompatible materials. Product may be corrosive to some metals.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Exposure Guidelines:

Calcium Chloride	None Established
Performance Additive	None Established

Engineering Controls: Use with adequate general ventilation to minimize exposures.

Respiratory Protection: In operations where exposure levels are excessive, a NIOSH approved respirator with dust/mist cartridges or supplied air respirator appropriate for the form and concentration of the contaminants should be used. Selection and use of respiratory equipment must be in accordance with OSHA 1910.134 and good industrial hygiene practice.

Skin Protection: Wear impervious gloves such as rubber or neoprene if needed to avoid prolonged skin contact.

Eye Protection: Safety glasses recommended.

Other: Long-sleeved clothing and long pants recommended to avoid prolonged skin contact. Suitable washing facilities should be available in the work area.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance And Odor: Clear liquid with no odor.

Physical State: Liquid	Odor Threshold: Not established
Vapor Density: Not determined	Initial Boiling Point/Range: 110-122°C (230-252°F)
Solubility In Water: Soluble	Vapor Pressure: Not determined
Relative Density: 1.25-1.42	Evaporation Rate: Not determined
Melting/Freezing Point: Not determined	pH: 5-10
VOC Content: Not determined	Octanol/Water Coefficient: Not determined
Solubility: Complete	Decomposition Temperature: Not determined
Viscosity: <100 cP @ 70°F	Flammability (solid, gas): Not applicable
Flashpoint: None	Autoignition Temperature: Not determined
Flammable Limits: LEL: Not determined	UEL: Not determined

10. STABILITY AND REACTIVITY

Reactivity: Not normally reactive

Chemical Stability: Stable under normal storage and handling conditions.

Possibility of Hazardous Reactions: None known.

Conditions to Avoid: None known.

Incompatible Materials: Strong oxidizing agents, concentrated acids, and some metals.

Hazardous Decomposition Products: When heated to decomposition emits hydrogen chloride, halogenated compounds, and chlorine gas.

11. TOXICOLOGICAL INFORMATION

HEALTH HAZARDS:

Ingestion: Ingestion may cause slight irritation with nausea, vomiting, and diarrhea.

Inhalation: Inhalation of mists may cause slight irritation of the nose throat and upper respiratory tract.

Eye: May cause slight irritation with pain and tearing.

Skin: May cause slight irritation on prolonged or repeated contact.

Sensitization: This material is not known to cause sensitization.

Chronic: None known.

Carcinogenicity: None of the components is listed as a carcinogen or suspected carcinogen by IARC, NTP, or OSHA.

Germ Cell Mutagenicity: None currently known.

Reproductive Toxicity: None currently known.

Numerical Measures of Toxicity:

No toxicity data available

12. ECOLOGICAL INFORMATION

Ecotoxicity: No data available

Persistence and Degradability: Biodegradation is not applicable to inorganic substances.

Bioaccumulative Potential: No data available

Mobility in Soil: No data available

Other Adverse Effects: None known

13. DISPOSAL CONSIDERATIONS

Dispose in accordance with local, state, and federal environmental regulations.

14. TRANSPORT INFORMATION

DOT Hazardous Materials Description:

Proper Shipping Name: Not regulated

UN Number: None

Hazard Class/Packing Group: None

Labels Required: None

15. REGULATORY INFORMATION

CERCLA: This product is not subject to CERCLA release reporting. Many states have more stringent release reporting requirements. Report spills required under federal, state, and local regulations.

SARA Hazard Category (311/312): Not Hazardous

SARA 313: This product contains the following chemicals subject to Annual Release Reporting Requirements under SARA Title III, Section 313 (40 CFR 372): None

EPA TSCA Inventory: All of the ingredients in this product are listed on the EPA TSCA Inventory.

CANADA:

This product has been classified under the CPR and this MSDS discloses information elements required by the CPR.

Canadian CEPA: All the components of this product are listed on the Canadian DSL.
Canadian WHMIS Classification: Not classified as dangerous

16. OTHER INFORMATION

NFPA Rating: Health = 2 Flammability = 0 Instability = 0
HMIS Rating: Health = 2 Flammability = 0 Physical Hazard = 0

SDS Revision History:

5/15/2014: New SDS

4/23/2015: Updated SDS with new classification

Disclaimer: *This Safety Data Sheet (SDS) is provided in response to customer requests to address the safe handling of the product. All statements, technical information and recommendations contained herein are the best of our knowledge, reliable and accurate. This SDS is not intended to make any representation as to how the product will perform when used for its intended purpose by a user. In that regards the product is sold "AS IS" and nothing in this SDS should be deemed to be a representation or warranty of any injury, loss, or damage, of any kind or nature, which are sustained by or arise from the use of the product. Nothing in this SDS is intended to be a representation or warranty by the manufacturer of the accuracy, safety, or usefulness for any purpose of any technical information, materials, techniques, or practices.*

The information contained in this Safety Data Sheet is to the best of our knowledge accurate and reliable. This information should be provided to all individuals handling this product. Federal state and local regulations should be followed when handling this product.

Road Dust Control with Calcium Chloride

Dust is an inherent problem with unsurfaced and gravel surfaced roads. The problem ranges from a simple but costly nuisance to a definite health hazard. The dust from traffic on such roads carries several hundred feet into nearby homes, damaging clothing and household furnishings. When road dust covers nearby crops, it often kills or stunts several rows, due to the shading effect and clogging of the plant stoma (pores). In human health, dust is one of the most common causes of allergies and hay fever and may be a conveyor of diseases like tetanus.

A related problem is the degeneration of the road surface. It must be bladed periodically to keep it passable and also may require addition of new aggregate to roads every year or so.

To stabilize roadbeds and control dust, many materials are currently available. One that has been used for over 50 years in various parts of the United States is calcium chloride. This fact sheet presents up-to-date procedures on the use of calcium chloride.

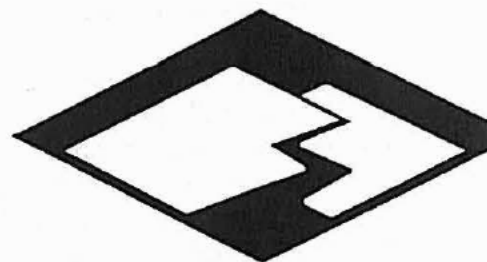
GENERAL INFORMATION

Calcium chloride (CaCl_2) is classified as a salt. It is obtained commercially from natural brine deposits or as a by-product of manufacturing sodium carbonate by Solvay Process. Calcium chloride is commercially processed as a clear liquid or as white flakes or pellets.

Three important properties make calcium chloride useful for a wide variety of applications. First is its deliquescence, the ability to become a liquid by absorbing moisture from the air. Second is its hygroscopicity, an extreme ability to absorb moisture without becoming a liquid. This ability to pull moisture from seemingly dry air maintains the road at a fairly uniform level of moisture. The valuable result is a binding effect on the particles and aggregate in the road base, thereby stabilizing the base and preventing dust. The third significant property of calcium chloride is that it is exothermic. This means that it releases heat as it dissolves. This property makes it a good deicer for snow and ice. However, this "heat of reaction" can raise its temperature hot enough to be a *safety hazard* to workers mixing flake or pellet calcium chloride in solution.

Vermont Local Roads Program

FACT SHEET



VERMONT LOCAL ROAD

Saint Michael's College
One Winooski Park, Box 260
Colchester, VT 05439

800-462-6555 (in VT)
802-654-2652
802-654-2555 (fax)

The three forms of calcium chloride are:

1. Flake, or Type I—comes in 100 pound bags, with a 77 to 80% calcium chloride content and water of crystallization.
2. Pellet, or Type II—comes in 80 pound bags, with a 94 to 97% calcium chloride content and less than 1% water of crystallization.
3. Liquid—comes in railroad tank cars and tanker trucks with the chemical in 32, 35 and 38% concentration.

ROAD PREPARATION AND APPLICATION

Calcium chloride can be added to a road surface during or after blading and shaping, throughout the year. The best results are obtained during spring maintenance, when the road still has moisture from spring rains. This maintenance should consist of adding new aggregate and fines, if required, while blading and shaping the road surface into a proper crown. A straight-line crown of ½ inch per foot has been found to be most satisfactory. It is vital that the borrow ditches be shaped for good drainage, because standing water is the main cause of potholes and road base failures. Culverts also need to be cleaned and repaired.

To apply flake or pellet calcium chloride, ordinary lime drill spreaders, tailgate spreaders or spinner disc spreaders can be used. For liquid calcium chloride, tanker trucks with spray bars can be used. After using, all equipment should be cleaned of the calcium chloride residue to prevent corrosion.

The manufacturers' recommended application rates for flake calcium chloride and its equivalent in pellet and liquid form range from 1 to 1.5 pounds of flake per square yard for newly treated roads or .5 to 1 pounds per square yard for roads treated the previous season. These application rates conform to the 1.5 pounds of flake per square yard recommended by the 1976 Maintenance Manual of AASHTO (American Association of State Highway and Transportation Officials). Table I below provides the application rates for liquid, flake and pellet calcium chloride.

When applying flake or pellet calcium chloride, the road must be moist. After the calcium chloride has been spread, a water truck must soak the surface to dissolve all flakes or pellets. When reshaping the road, in addition to spreading calcium chloride, it may also be blade-mixed with new aggregate.

TABLE I
Equivalent Rates of Application
(Specific formulas—see below)

Flake lbs./sq.yd.	Pellet lbs./sq.yds.	Liquid (concentrations)		
		38%	35%	32%
0.5	0.41	0.09	0.10	0.11
0.75	0.61	1.13	0.15	0.16
1.00	0.82	0.17	0.19	0.22
1.25	1.02	0.22	0.24	0.27
1.50	1.23	0.26	0.29	0.33

During dry spells with low humidity, it may be necessary for a water truck to soak the road to continue the action of the calcium chloride.

Application rates for a given road can be calculated, using Table I with the following procedure.

Example: Several homeowners along a quarter mile of 20-foot wide gravel road have complained of dust problems. Since the road has never had calcium chloride added to it, the desired application rate is 1.5 pounds of flake per square yard or its equivalent in 32% liquid or pellet. The procedure:

1. Determine road area to be covered.

$$\text{Area yd.}^2 = \frac{\text{width (ft)} \times \text{length (ft)}}{9 \text{ ft.}^2 (1 \text{ yd.}^2)}$$

$$\text{Length} = .25 \text{ mile} \times 5,280 \text{ ft./mile} = 1,320 \text{ ft.}$$

$$\text{Thus: area} = \frac{20 \text{ ft.} \times 1,320 \text{ ft.}}{9} = 2,933 \text{ yd.}^2$$

FLAKES

2. Next determine quantity of flake needed for the desired application rate.

$$\text{lbs. needed} = \text{area to be covered (obtained above)} \times \text{desired application rate.}$$

$$\text{lbs. of flake} = 2933 \text{ yd.}^2 \times 1.5 \text{ lb./yd.}^2 = 4399.5 \text{ lbs. needed.}$$

3. Determine the number of bags required.

$$\text{no. of bags} = \frac{\text{lbs. of flake (from No. 2 above)}}{100 \text{ lb./bags (general information)}}$$

$$\text{no. of bags} = \frac{4399.5 \text{ lbs.}}{100 \text{ lb./bag}} = 44 \text{ bags needed}$$

PELLETS

2. Determine quantity of pellets needed at desired application rate.

lbs. of pellet = area to be covered (from No. 1) × desired application rate (Table I)

lbs. of pellets = $2,933 \text{ yd.}^2 \times 1.23 \text{ lbs./yd.}^2 = 3607.6 \text{ lbs.}$

3. Determine the number of bags required.

no. of bags = $\frac{\text{lbs. of pellet (from No. 2 above)}}{80 \text{ lb/bags (general information)}}$

no. of bags = $\frac{3607.6 \text{ lbs.}}{80 \text{ lb/bag}} = 45 \text{ bags needed}$

LIQUID

2. Determine quantity of 32% liquid needed at desired application rate.

gallons of liquid = $2933 \text{ yd.}^2 \times .33 \text{ gal/yd.}^2 = 967.89 \text{ gallons}$

Therefore, it will take 44 bags of flake, 45 bags of pellet or about 1,000 gallons of 32% liquid to treat this section of road. Using this procedure, a good cost comparison between available products can be made.

STORAGE

Calcium chloride can be stored in buildings, hoppers, silos or covered piles. The type of storage facility will depend upon the amount of product to be stored and the length of time it is stored. Three requirements are necessary for safe storage:

1. The material must be kept dry and, especially in warm weather, protected from humidity.
2. Drainage should be away from the storage area to prevent any possible runoff contamination of nearby creeks or lakes.
3. In storage, the floors or pads at ground level should be of bituminous paving or treated concrete.

When simple stockpiles are used, the calcium chloride should have polyethylene or vinyl-coated nylon covering the entire pile. This cover must be

held firmly in place by means of timbers, old tires, sand or other anchorage. If a building is used, the floors, walls, and ceiling must be as airtight as possible, to prevent moisture from getting into the calcium chloride. Doors which swing open may allow excessive air leakage. Hoppers or silos can be made of carbon steel but, in this case, moisture exclusion is of the utmost importance in preventing rust.

When overhead storage is used with a gravity feed system for flake calcium chloride, an angle of 45° from the horizontal is required for flow. For pellet calcium chloride, an angle of 35° from the horizontal is required for gravity flow.

SAFETY AND DISPOSAL

Calcium chloride and its solutions present the same handling problems as other, similar salts. Contact of the solid material with the eyes will result in irritation or injury to the eye. A mild burn to the skin may be caused by prolonged contact. Reasonable handling, care and cleanliness, plus the use of safety goggles, should be enough to prevent injury. If gross contact with solid or solution does occur, the affected area should be washed thoroughly with clear water and medical attention obtained. Contaminated eyes should be flushed thoroughly with large amounts of water for at least 15 minutes, then medical attention should be obtained promptly.

Care must be taken when mixing flakes or pellets with water because calcium chloride gives off heat when dissolved (it is exothermic). Flake calcium chloride may cause a temperature rise of as much as 84°F when mixed in heavy concentration. Pellet calcium chloride can cause a temperature rise of up to 158°F under these same conditions. *Always use cool water* when dissolving calcium chloride, to prevent the possible boiling of the solution. In a closed tank, this temperature rise may cause a dangerous increase in pressure.

When disposing of calcium chloride and its solutions, care should be taken to prevent the product or brine from entering drinking water supplies or from being spread onto plants and shrubbery. In excess, it may kill or burn vegetation. Adding enough water to the brine may dilute its concentration to acceptable levels for ground surface disposal. Care should also be taken when cleaning out the mixing and processing equipment, for the same reasons.

CORROSION AND EQUIPMENT HAZARDS

After spreading and mixing with the roadway soil, the concentration level of calcium chloride will be relatively low. The calcium chloride will be held within the roadway and is not available for direct contact with vehicular traffic or the surrounding environment. For this reason, calcium chloride concentrations mixed in the road base are much, much lower than when the material is spread dry on the surface for use in snow and ice control. If recommended spreading, watering and mixing procedures are followed, no health or corrosion hazard will exist for nearby residents or anyone using the treated road. The only corrosion problem to be expected from the use of calcium chloride might be in rusting of the spreader equipment, if prompt cleaning is not done.

Aluminum and its alloys *must not* be used in spreading equipment, as they deteriorate rapidly upon exposure to calcium chloride. Explosion-proof equipment may also be desirable when large amounts of calcium chloride dust are present around electrical equipment. When applying calcium chloride for dust control or road stabilization, *do not* spread it over bridge decks. If workers spill calcium chloride on a paved surface, clean or wash this area as soon as possible to prevent creation of a slick spot. Calcium chloride should meet these standard specifications:

1. Calcium chloride shall meet the requirements of ASTM D98-77a or latest specifications.
2. Sampling and testing calcium chloride for roads and structural applications—ASTM 0345-74 or latest specifications.

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THE VERMONT
LOCAL ROADS PROGRAM
SAINT MICHAEL'S COLLEGE
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RoadSaver®

UNPAVED ROAD STABILIZER & SUPPRESSANT

DUST CONTROL AND SOIL STABILIZATION



Suppression and Stabilization in Sync

RoadSaver is a high purity grade of magnesium chloride ($MgCl_2$) used as a dust control and soil stabilization agent.

Uses and Application

Road surface preparation is extremely important in all application techniques. However, these preparations do not need to be time consuming or costly. The better the road conditions, the more successful the application will be. The following four factors work together to achieve optimum results:



Quality and composition of aggregate



Compaction



Road preparation



Application rate

People Helping People Improve Their Environment

For more than 30 years, EnviroTech Services, Inc. has proven to be an industry leader in soil stabilization and road solutions. We effectively produce high performing products that provide our customers with improved efficiency and reduced cost. We achieve these goals while, at the same time, reducing environmental impact and enhancing sustainability.



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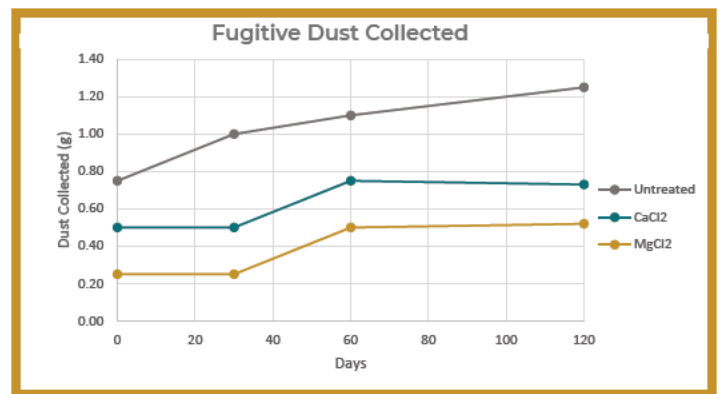
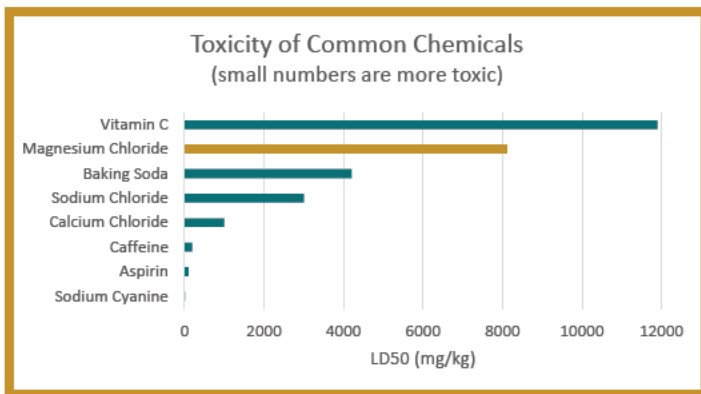
910 54th Avenue, Suite 230
Greeley, CO 80634

Performance

RoadSaver is the least harmful of common dust suppressants to vegetation and groundwater according to independent studies conducted by the U.S. Department of Agriculture. It is non-irritating and safer to handle, and won't cause the burning or stinging associated with some other dust control products. RoadSaver is free of toxic metals and substances. It is used as an ice control agent, and as a fertilizer for crops such as turf and small grains.

Features and Benefits

- Allows for cleaner air and reduces dust to PM10 Standard
- Improves road quality with fewer potholes and less washboarding
- Ensures public safety
- Reduces road maintenance while creating more value for the dollar
- Can be used on many soil types



“ *EnviroTech's product is always within the guidelines set in the contract.*
 Jake B. Mall, Garfield County, CO Road & Bridge Department

*We have used everything from tree sap to calcium chloride and waste oil.
 To date, magnesium chloride [RoadSaver] is the best thing we've used.*
 William J. Hoffbeck, City of Lakeville, MN ”

Contact EnviroTech Services for a complete evaluation of your road preparation and dust control needs.



Call Us
 Phone: 1.800.369.3878
 Fax: 1.970.346.3959

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Info@EnviroTechServices.com

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