



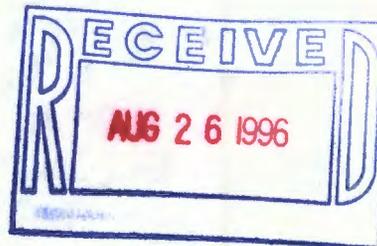
DEPARTMENT OF THE AIR FORCE

HEADQUARTERS 49TH FIGHTER WING (ACC)
HOLLOMAN AIR FORCE BASE, NEW MEXICO

21 AUG 1996

MEMORANDUM FOR NEW MEXICO ENVIRONMENT DEPARTMENT

Hazardous and Radioactive Materials Bureau
RCRA Permits Program
Attn: Dr. Barbara Hoditschek, Manager
2044 Galisteo
P.O. Box 26110
Santa Fe NM 87502-6110



FROM: 49 CES/CD
550 Tabosa Ave
Holloman AFB NM 88330-8458

SUBJECT: Interim Actions for the Holloman AFB (HAFB) Sewage Lagoons Closure

1. This letter is to apprise you of the current status of the lagoons and provide information about interim actions to be taken to control disease vectors and odors from the lagoons as they dry out. This was discussed in a 12 Aug 96 phone conversation between your Ms. Stephanie Kruse and Dr. Fred Fisher of HAFB.
2. The new wastewater plant began operation on 30 July 96. The wastewater was diverted away from the lagoons using valves installed in the headworks of the old wastewater plant. The valves allow wastewater to be reintroduced to the lagoons if necessary, but we do not plan to do this because it will ultimately delay the closure process by lengthening the time period for the lagoons to dry out. Currently, no water is passing from Lagoon E to Lagoon G. Instead, water is being retained in upper Lagoons A-F and is recirculated from F to A and B, and the aerators in A and B are still operating. The purpose of these actions is to maintain as much mixing and, therefore, as much aeration in the wastewater as possible. At the current rate of drying, it is anticipated that the lagoons will be mostly dry by late September or early October 1996.
3. All interim efforts will concentrate on the upper Lagoons (A-F), which receive wastewater most directly and are closest to populated areas. As the upper lagoons dry out, they will tend to develop problems with odors and disease vectors (mosquitoes). Odor control will be accomplished by using a chemical deodorizing agent (see attached) to reduce the release of hydrogen sulfide and other sulfur-containing compounds. The deodorizing agent proposed for use is non-toxic and biodegradable and will be applied into the splitter box above Lagoons A and B, or to Lagoon F, to be dispersed by the circulation. If necessary, the deodorizing agent may be applied from a small boat deployed in the individual lagoons. We expect to use a total of approximately 500 gallons of the deodorizing agent.
4. As soon as conditions in the Lagoons are suitable for the operation of heavy equipment, the bank liners will be removed, and the dikes that are elevated above-grade will be used to supply

soil for filling in puddled areas to eliminate stagnant standing water that is conducive to mosquito breeding. It is anticipated that the bank liners will eventually be buried in one of the upper lagoons (A or B).

5. An alternative to the procedure in paragraphs 3 and 4 above is to use lime to reduce odors and eliminate vectors. However, the lime cannot be introduced into the lagoons while significant standing water is still present and it is much more expensive than the deodorizing agent required for the same amount of odor control. It is possible that lime may be used in the upper two lagoons (A and B) as part of the vector control effort during the stage where the puddled water is being covered. It is anticipated that lime could be procured quickly if necessary.

6. It is our intention to move ahead with these measures as necessary to protect public health. We would appreciate any comments or suggestions you might have. Please direct questions or verbal comments to Dr. Fred Fisher of the Civil Engineer Environmental Flight, 49 CES/CEV, at (505) 475-3931/5062.


HOWARD E. MOFFITT
Deputy Base Civil Engineer

Attachment:

Proposed chemical deodorizing agent

cc (with Atch):

Ms. Stephanie Kruse
Hazardous and Radioactive Materials
Bureau
New Mexico Environment Dept
2044 Galisteo
P.O. Box 26110
Santa Fe NM 87502-6110

Mr. Gene Keepper
US EPA Region VI
1445 Ross Avenue, Suite 900
Dallas TX 75202-2733

cc: (w/o Atch)

Mr. Robert Michna
Radian Corporation
8501 Mo-Pac Blvd
P.O. Box 201088
Austin TX 78720-1088

HQ ACC/CEVCM
Attn: Mr. Larry Isaacs

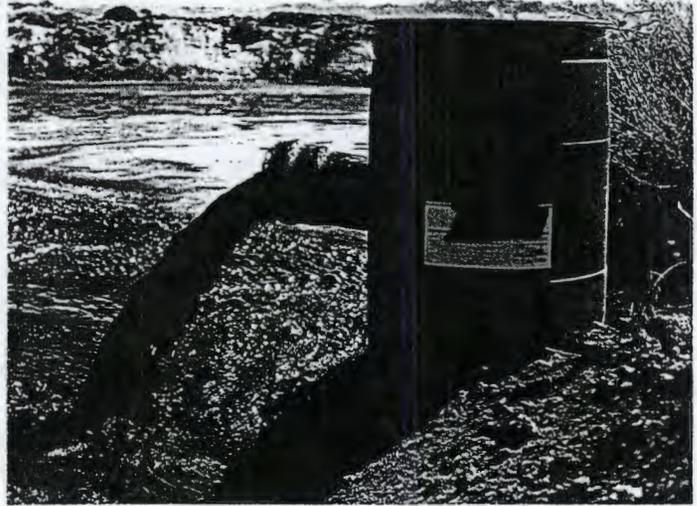
49 CES/CEVR
Attn: Mr. Warren Neff

WASTEWATER TREATMENT

Formula: [REDACTED]

Dosage Rate: Anywhere from .01 to 10 ppm of [REDACTED] concentrate against the total volume of wastewater per day is suggested. [REDACTED] dosage rate may change with fluctuating gas levels. Any combination of the two formulas can be used or each formula can be used alone. For wastewater containing high levels of neutral gases, use a higher percentage of [REDACTED]. For high levels of acidic or alkaline gases, use a higher percentage of [REDACTED]. For topical applications, [REDACTED] can be diluted 50 to 100 times and sprayed over the surface of wastewater for an immediate but temporary remedy.

Where & How: To maintain optimal conditions, [REDACTED] should be applied daily or regularly either by using an automatic drip system or by manually pouring [REDACTED] into the wastewater entrance area where there is the most turbulence. Consistent use of [REDACTED] will prevent the production of new gases as well as combat aging gases so, considerably less and less [REDACTED] concentrate will be required to maintain optimal conditions over time.



SLUDGE TREATMENT

Formula: [REDACTED]

Dosage Rate: [REDACTED] formulas can be sprayed at full concentration or diluted several hundred times.

Where & How: [REDACTED] can be sprayed directly into digester tanks, over the surface of sludge as it's transported to drying beds, or during dehydration. Manual spraying of a diluted [REDACTED] solution is effective but for best results, we recommend using an automatic fogger or misting system, one which would regulate frequency and dilution rates. Using a higher level of [REDACTED] concentrate in an atomizer or fogging system will yield quicker results with less moisture. For indoor applications, [REDACTED] can be used at full concentration with less frequency than outdoor applications. [REDACTED] can also be used during sludge transportation. Dilute and spray [REDACTED] over the sludge after it has been loaded onto trucks to control odors during travel. Once the truck has been unloaded, a diluted [REDACTED] solution can be used to rinse the bed of the truck to remove any residual sludge odors.



LANDFILL APPLICATIONS

Formula: [REDACTED]

Dosage Rate: [REDACTED] formulas can be sprayed at full concentration or diluted several hundred times.

Where & How: A diluted [REDACTED] solution can be incorporated into a perimeter fogging system or manually sprayed over the surface of the landfill. [REDACTED] should be applied regularly in order to effectively reduce odors and prevent ensuing complaints from neighbors. An exact agenda is ultimately left for the end-user to determine, based on the strength of odors, how frequently the landfill is added to and weather conditions such as wind direction and temperature. A diluted [REDACTED] solution can also be used at transfer stations or to wash transportation vehicles.



PRODUCT SPECIFICATIONS

Compounds and Physical Properties

Organic and Salt of Organic Acids
 Amine Compounds
 Betaine Compounds
 Water
 pH 5.0 - 6.7 (at 25°C)
 Boiling Point 100°C
 Freezing Point 0°C
 Vap. Press Same as Water
 Solubility in Water Completely
 Sp. Gravity 1.17 ± 0.05 (At 25°C)
 Range of Molecular Weight 50 - 800
 Appearance Transparent Sl. Yellow
 Odor None

Compounds and Physical Properties

Glycine Betaine
 Organic and Salt of Organic Acids
 Amine Compounds
 Essential Oils
 Water
 pH 5.2 - 6.7 (at 25°C)
 Boiling Point 100°C
 Freezing Point 0°C
 Vap. Press Same as Water
 Solubility in Water Completely
 Sp. Gravity 1.06 ± 0.05 (At 25°C)
 Range of Molecular Weight 50 - 800
 Appearance Transparent Sl. Yellow
 Odor Floral Scent

Theoretical Rate for Deodorization Effect on Each Type of

Deodorizing effect by 1 gram of each type of is as follows: (Units below are measured in mg.)

Type of	Ammonia NH ₃	Hydrogen Sulfide H ₂ S	Trimethylamine (CH ₃) ₃ N	Methyl Mercaptan CH ₃ SH
	24.1	42.7	83.7	21.6
	6.1	20.1	21.2	2.6
	11.9	14.3	41.3	5.5

Head Space Deodorization Test Procedure

One milliliter of deodorizer and 19ml of solution which includes odorous gas and water (total 20ml) is mixed then added into a 500ml Erlenmeyer flask. The flask is shut with the rubber stopper and stirred for 10 minutes. Then the concentration of odorous gas (in the head space of the upper portion of the flask) is measured by a gas analyzer.

As a comparison, the same test procedure was done with only water and competitive products and water.

By the simple Head Space Method of testing, it is easy to see effectiveness on reducing and eliminating ammonia and various other gases.

Test Specifications

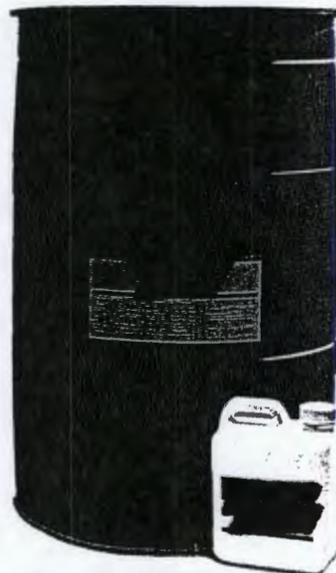
Erlenmeyer Flask: 500ml
 Time Period Before Measurement: 10 min.
 Measurement Device: Gas Analyzer
 Amount Deodorizer: 1ml
 Amount of Solution: 19ml
 Temperature: 25°C

Rate of Elimination for

	Original Content	After Adding
Ammonia	700ppm	20ppm
Hydrogen Sulfide	3000ppm	40ppm
Methyl Mercaptan	10ppm	< 1ppm
Trimethylamine	120ppm	trace

Rate of Elimination for

	Original Content	After Adding
Ammonia	700ppm	100ppm
Hydrogen Sulfide	3000ppm	120ppm
Methyl Mercaptan	10ppm	3ppm
Trimethylamine	120ppm	5ppm



19160 S. Van Ness Avenue
 Torrance, CA 90501-1101
 310-782-0190 fax: 310-782-0191
 800- (800-376-5366)

[REDACTED]

[REDACTED] (1/3)

MATERIAL SAFETY DATA SHEET

[REDACTED]

Phone: 03-3823-1111
Fax : 03-3823-1189

PRODUCT NAME: [REDACTED] DEODORIZER

DATE PRINTED: October 20, 1993
DATE REVISED: October 1, 1993

[REDACTED] is a deodorizer made from fine organic chemicals and complex compounds. [REDACTED] is biodegradable, emulsifiable, a dissolver and neutralizer. [REDACTED] is a chemical product with a normal substance which contains no violent or poisonous components.

1. INGREDIENTS

	WT %	CAS NO.
Glycine betaine compound	20.0	107-43-7
Sodium citrate	7.0	68-04-2
Sodium dihydrogen phosphate	13.0	7558-80-7
Noigen ET 160	1.0	9002-92-0
(The complete chemical name: Polyethylene glycol lauryl ether)		
Water	59.0	7732-18-5

"Water" does not include hydrate water or water in aqueous solution of other ingredients.

*Solid ingredients: 36.2 WT%

2. PHYSICAL DATA

pH	5.0 - 6.7 (at 25 °C)
Boiling Point	100 °C
Freezing Point	-1.0 °C
Vap. Press	same as water
Soluble in Water	completely
Sp. Gravity	1.17 ± 0.05 (at 25 °C)
Range of Molecular Weight	50 - 800
Appearance	slightly yellow to dark green
Odor	slight odor

® INDICATES A REGISTERED TRADEMARK OF [REDACTED]

3. FIRE AND EXPLOSION HAZARD DATA

Flash Point	none
Method Used	JIS
Flammable Limit	none
Extinguishing Media	not required
Fire and Explosion Hazards	none
Fire-Fighting Equipment	not required

4. REACTIVITY DATA

Stability	stable
Incompatibility	stable (specific materials to avoid : consult manufacturer for specific cases)
Hazardous Decomposition Product	none
Hazardous Polymerization	will not occur

5. ENVIRONMENTAL AND DISPOSAL INFORMATION

Action to take for spills/leaks	flush with water
Disposal Method	materials should be placed in a container and disposed of according to local provisions

6. HEALTH HAZARD DATA

Acute Toxicity by Oral (mouse):
On this dosage by the ratio of 2 ml/kg of body weight,
the mouse was observed alive.

Ames Salmonella/Microsome plate test:
Significant differences were not observed.

96 Hours Acute Toxic Test on Oryziaslatipes (red killifish):
96 hour LC50 values was 1,940 mg/liter.

7. FIRST AID PROCEDURE

	HAZARDS	FIRST AID
Contact with Skin	none	flush with water
Contact with Eyes	none	flush with water (if irritation results, call a physician)
Inhalation	none	gargle
Ingestion	none	drink large quantities of water

8. THE INCLUDED AMOUNT OF TOXIC SUBSTANCE

NAME OF SUBSTANCE	MEASURED RATE	METHOD OF ANALYSIS
1) Cadmium	none	According to JIS
2) Cyanide	none	"
3) Organic Phosphorous	none	"
4) Lead	none	"
5) Chromium (VI)	none	"
6) Arsenic	none	"
7) Mercury	none	"
8) Alkyl Mercury	none	"
9) PCB	none	"

9. HANDLING PRECAUTION

Eye Protection

Use goggles or chemical goggles

10. ADDITIONAL INFORMATION

Special precautions to be taken in handling and storage:

AVOID DIRECT SUNLIGHT

If exposed to direct sunlight, the EPOLEON will turn from a slightly yellow color to a slightly blue color then to dark blue. However, this solution will still be transparent and the effectiveness will not change.

Storage Conditions:

1. Three (3) year guarantee after shipment at storage temperatures between 3° C to 20° C
2. One (1) year guarantee after shipment at the maximum storage temperatures of 40° C