

February 2, 1994

M E M O R A N D U M

TO: Martin Bauer, Chief
Construction Permits Bureau
Permits and Enforcement

FROM: Dan Salgado, Air Quality Engineer *DS*
Construction Permits Bureau

SUBJECT: Shoshone Funeral Service (Kellogg) -- P-931108
(Cremator Incinerator) PTC Technical Analysis

I. PROJECT DESCRIPTION

Shoshone Funeral Service proposes to install a type IV cremator incinerator. The incinerator utilizes two combustion chambers, a primary chamber and a secondary chamber. Human remains contained in a wooden box are placed in the primary chamber and burned. The combustion gasses pass through the secondary chamber (afterburner) to accommodate more complete combustion. The proposed incinerator has a maximum design capacity of one hundred pounds per hour (100 lbs/hr).

II. SUMMARY OF EVENTS

On November 12, 1993, the Division of Environmental Quality (DEQ) received an application for a permit to construct a type IV cremator incinerator. DEQ has reviewed all the information and has determined that, based on all federal and state rules and regulations, the source meets all of the provisions set fourth in IDAPA 16.01.01012 and should be issued a permit to construct.

A. Discussion

1. Area Classification

The cremator incinerator will be installed at the Shoshone Funeral Home in Kellogg, Idaho. The area is classified as attainment or unclassified for all criteria pollutants.

2. Emission Estimates

Emissions from the facility were calculated using AP-42, Table 2.1-3, for pathological waste. Particulate emissions were calculated to be 0.4 pounds per hour. According to AP-42, figure 2.1-7, approximately fifty percent (50%) of the total particulate emissions will be PM-10. Therefore, the PM-10 emissions will be about 0.2 pounds per hour. All other emissions are negligible.

According to AP-42 emission factors, the only other emissions will be NO₂ at 0.15 pounds per hour. The applicant used stack data provided by the incinerator manufacturer. Their calculations estimate particulate emissions of 0.13 pounds per hour and carbon monoxide emissions of 0.0123 pounds per hour. The emission factors from AP-42 were used to make the determination. The calculations are attached in Appendix A.

3. Facility Classification

The facility is a non-designated facility as defined by IDAPA 16.01.01003.29. The facility is a non-major facility as defined by IDAPA 16.01.01003.56. The facility is a funeral service (SIC 7261).

4. Regulatory Review

The facility is subject to the following permitting requirements:

<u>IDAPA 16.01.01012.02</u>	Permit to Construct;
<u>IDAPA 16.01.01012.04</u>	Application Procedures;
<u>IDAPA 16.01.01012.05</u>	Permit Requirements for New and Modified Stationary Sources;
<u>IDAPA 16.01.01012.13</u>	Procedure for Issuing Permits;
<u>IDAPA 16.01.01012.14</u>	Conditions for Permits to Construct;
<u>IDAPA 16.01.01012.15</u>	Obligation to Comply;
<u>IDAPA 16.01.01501</u>	Rules for Control of Incinerators;
<u>IDAPA 16.01.01502</u>	Emission Limits; and
<u>IDAPA 16.01.01503</u>	Design Standards.

5. Modeling

Modeling was done using EPA's Screen Version 1.1 to estimate the impacts of the particulate emissions to the ambient atmosphere. Downwash was utilized as well as an urban environment. The maximum concentration of particulate matter emitted, based on continuous operation, is $3.97 \mu\text{g}/\text{m}^3$. This is below the significant level of $5 \mu\text{g}/\text{m}^3$. The background concentration at Kellogg is $90 \mu\text{g}/\text{m}^3$ according to Chris Johnson, Staff Meteorologist. The total concentration will be $94 \mu\text{g}/\text{m}^3$, which is below the NAAQS of $150 \mu\text{g}/\text{m}^3$. The model output is attached as Appendix B.

6. Fees

Because this project is not subject to any NSPS and does not emit 100 tons per year of any regulated pollutant, fees do not apply to this facility.

III. RECOMMENDATION

Based on review of all applicable federal and state rules and regulations, Staff recommends that Shoshone Funeral Home be issued a permit to construct a crematory incinerator. Also, since the source does not fall under the requirements of the Prevention of Significant Deterioration, no public comment period is required.

DS/skr:SHOSHON.TM

cc: Source File
COF 1.1

APPENDIX A

Emission Calculations

Shoshone Funeral Home (P-931108)

AP-42 Table 2.1-3 Emission Estimats

$$(8 \text{ lbs/ton})(1 \text{ ton}/2000 \text{ lbs})(100 \text{ lbs/hr}) = 0.4 \text{ lbs/hr TSP}$$

from figure 2.1-7 50% of TSP is PM-10, therefore

$$(0.4 \text{ lbs/hr})(0.5) = \underline{0.2 \text{ lbs/hr PM-10}}$$

$$(0.2)(2912 \text{ hrs/yr})(1 \text{ ton}/2000 \text{ lbs}) = \underline{0.29 \text{ tons/yr PM-10}}$$

APPENDIX B

Model Output

1

12-20-93

10:06:09

*** SCREEN-1.1 MODEL RUN ***

*** VERSION DATED 88300 ***

SHOSHONE PARTICULATES

SIMPLE TERRAIN INPUTS:

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SOURCE TYPE           = POINT
EMISSION RATE (G/S)   = .2520E-01
STACK HEIGHT (M)      = 6.10
STK INSIDE DIAM (M)   = .51
STK EXIT VELOCITY (M/S) = 5.90
STK GAS EXIT TEMP (K) = 865.40
AMBIENT AIR TEMP (K)  = 293.00
RECEPTOR HEIGHT (M) = .00
IOPT (1=URB,2=RUR)   = 2
BUILDING HEIGHT (M)   = 3.70
MIN HORIZ BLDG DIM (M) = 12.20
MAX HORIZ BLDG DIM (M) = 30.50

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BUOY. FLUX = 2.49 M**4/S**3; MOM. FLUX = .77 M**4/S**2.

*** FULL METEOROLOGY ***

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*** SCREEN AUTOMATED DISTANCES ***
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*** TERRAIN HEIGHT OF 0. M ABOVE STACK BASE USED FOR FOLLOWING DISTANCES ***

DIST SIGMA (M)	CONC (UG/M**3) DWASH	STAB	U10M (M/S)	USTK (M/S)	MIX HT (M)	PLUME HT (M)	SIGMA Y (M)
1.	.0000	0	.0	.0	.0	.0	.0
.0	NA						
100.	5.607	4	10.0	10.0	3200.0	9.4	8.3
7.0	HS						
200.	3.962	4	5.0	5.0	1600.0	14.3	15.8
10.9	HS						
300.	3.090	4	4.0	4.0	1280.0	16.7	22.8
14.0	HS						
400.	2.620	4	3.0	3.0	960.0	20.2	29.7
17.3	HS						
500.	2.211	4	2.0	2.0	640.0	27.3	36.7
20.7	HS						

MAXIMUM 1-HR CONCENTRATION AT OR BEYOND 1. M:
 12. 17.03 4 15.0 15.0 4800.0 5.8 1.2
 2.7 HS

DWASH= MEANS NO CALC MADE (CONC = 0.0)
 DWASH=NO MEANS NO BUILDING DOWNWASH USED
 DWASH=HS MEANS HUBER-SNYDER DOWNWASH USED
 DWASH=SS MEANS SCHULMAN-SCIRE DOWNWASH USED
 DWASH=NA MEANS DOWNWASH NOT APPLICABLE, X<3*LB

*** CAVITY CALCULATION - 1 ***	*** CAVITY CALCULATION - 2
CONC (UG/M**3) = .0000	CONC (UG/M**3) =
.0000	
CRIT WS @10M (M/S) = 99.99	CRIT WS @10M (M/S) =
99.99	
CRIT WS @ HS (M/S) = 99.99	CRIT WS @ HS (M/S) =
99.99	
DILUTION WS (M/S) = 99.99	DILUTION WS (M/S) =
99.99	
CAVITY HT (M) = 3.78	CAVITY HT (M) =
3.70	
CAVITY LENGTH (M) = 17.44	CAVITY LENGTH (M) =
11.70	
ALONGWIND DIM (M) = 12.20	ALONGWIND DIM (M) =
30.50	

CAVITY CONC NOT CALCULATED FOR CRIT WS > 20.0 M/S. CONC SET = 0.0

 *** SUMMARY OF SCREEN MODEL RESULTS ***

CALCULATION PROCEDURE	MAX CONC (UG/M**3)	DIST TO MAX (M)	TERRAIN HT (M)
SIMPLE TERRAIN	17.03	12.	0.

 ** REMEMBER TO INCLUDE BACKGROUND CONCENTRATIONS **

Operates 8 hrs/day : 24 hr average concentration =

$$(17.03 \text{ ug/m}^3)(0.7)(8/24) = \underline{3.97 \text{ ug/m}^3}$$

$$\text{Background} = 90 \text{ ug/m}^3$$

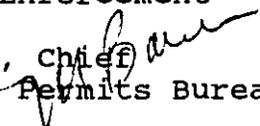
$$\therefore \text{Total concentration} = 90 \text{ ug/m}^3 + 3.97 \text{ ug/m}^3 = 93.97 \text{ ug/m}^3$$

NAAQS = 150 ug/m³ ∴ ok

February 2, 1994

MEMORANDUM

TO: Orville D. Green, Assistant Administrator
Permits and Enforcement

FROM: Martin Bauer, Chief 
Construction Permits Bureau

SUBJECT: Shoshone Funeral Service (Kellogg) -- P-931108
(Cremator Incinerator) PTC No. 079-00019

Purpose

The purpose of this memorandum is to satisfy the requirements of IDAPA 16.01.01012 (Rules for the Control of Air Pollution in Idaho) for issuing permits to construct.

Project Description

Human remains contained in a wooden box are placed in an incinerator and burned in the primary chamber. The combustion gasses pass through a secondary chamber which is heated to a temperature of 1800°F. The secondary chamber (afterburner) facilitates an increase in combustion efficiency reducing the amount of emissions to the atmosphere.

Discussion

On November 12, 1993, the Division of Environmental Quality (DEQ) received a permit to construct application for a crematory incinerator. On December 8, 1993, the DEQ determined the application complete.

Fees

Because this project is not subject to any NSPS and does not emit 100 tons per year of any regulated pollutant, no fees apply to this project.

Recommendation

Staff reviewed the permit to construct application and, based on the applicable state and federal regulations, recommend that Shoshone Funeral Service be issued a permit to construct. Staff also recommend that no public comment period is needed on this project, because the source does not fall under the requirements for Prevention of Significant Deterioration (PSD).

MB/DS/~~sk~~.SHOSHON.MM

cc: R. Wilkosz; P. Rayne; G. Burr, NIRO; Source File; COF