### MINUTES

# MONTANA SENATE 54th LEGISLATURE - REGULAR SESSION

### COMMITTEE ON NATURAL RESOURCES

Call to Order: By CHAIRMAN LORENTS GROSFIELD, on January 30, 1995, at 1:00 PM

## ROLL CALL

### Members Present:

Sen. Lorents Grosfield, Chairman (R)

Sen. Mack Cole (R)

Sen. William S. Crismore (R)

Sen. Mike Foster (R)

Sen. Thomas F. Keating (R)

Sen. Ken Miller (R)

Sen. Vivian M. Brooke (D)

Sen. B.F. "Chris" Christiaens (D)

Sen. Jeff Weldon (D)

Sen. Bill Wilson (D)

Members Excused: Sen. Larry Tveit

Members Absent: None

Staff Present: Todd Everts, Environmental Quality Council

Theda Rossberg, Committee Secretary

Please Note: These are summary minutes. Testimony and

discussion are paraphrased and condensed.

# Committee Business Summary:

Hearing: SB 199

Executive Action: None

### HEARING ON SB 199

{Tape: 1; Side: A}

# Opening Statement by Sponsor:

SEN. MIKE FOSTER, District No. 20, Broadwater County, Jefferson County, Meagher County, and some of Lewis & Clark County, said the Ashgrove Cement Plant proposes to burn hazardous waste, and that is a public issue. He said in October a survey was sent to the people of northern Jefferson County to find out the reaction from the residents to that proposal. He reviewed the results of that survey with the committee members. 58% said they favored

the siting bill which would disallow the burning of hazardous waste. EXHIBIT 1 and 1a.

SEN. FOSTER said he received a letter from the Montana City Elementary School supporting SB 199. EXHIBIT 2.

SEN. FOSTER said Page 3 and 4 of SB 199 says, "a permit may not be issued under 75-10-406 for a commercial hazardous waste incinerator located: (a) within 3 miles of: (i) a school; (ii) a residence; (iii) a public water supply; or (b) within 1 mile of a ground water well that serves a public water supply, etc." He said hazardous waste burning not only affects residents of Montana, but it is a national issue. There are 22 states that have prohibited hazard waste burning. SEN. FOSTER requested that the people testifying present the facts on hazard waste burning as they know to be true, and to respect the views of others. Playing on emotions, and making personal attacks, would be showing disrespect to everyone present.

SEN. FOSTER asked the committee members to decide carefully when considering action on SB 199, and ask themselves if they would want their children or grandchildren attending a school one-half mile from a facility that would be burning hazardous waste.

# Proponents' Testimony:

Paul Johnson, Chairman Board of Directors, Montanans For A Healthy Future, said SB 199 is necessary because the proposal for Ash Grove to burn hazardous waste does not protect public health. They have had as many as 2 upsets per month, and that is hazardous to public health. The facility is located next to a stream and only one-half mile from the Montana City School, and hazardous waste burning would allow hazardous emissions to affect public health. Mr. Johnson urges the passage of SB 199.

Glenna Obie, Jefferson County Commissioner, said the commission is considering local planning and zoning regulations, which would require storage and burning of hazardous waste to be located at least 2 miles from a school or day care. They sent a survey to 690 property owners in the vicinity, asking them if they approved or opposed the plan. They received 172 responses of which, 114 were in favor of the plan and 58 were in opposition. EXHIBIT 3. Ms. Obie invited the committee members to visit the Ash Grove Cement Plant and notice the proximity to the Montana City School, homes and Prickly Pear Creek. She stated that the monitoring of emissions only tell how bad the emissions are after the accidents have already occured.

{Comments: the acoustics in Room 312-2 are such, that the tapes are not clear}

Connie O'Conner, Physician, Leo Pocha Clinic and Shodair Hospital, said developing fetuses and the elderly are especially vulnerable to toxic exposures. Heavy metals and lead are present in dioxins. Children are especially vulnerable to lead. Dioxins cause mental retardation, blindness and severe abdominal pain in children. The final study has not been completed on the effect of exposure to dioxins. Ms. O'Connor said her 11 year old son has a rare form of cancer, and still wonders if that could have been caused by exposure to dioxins. Studies have been done on occupational illnesses that have been exposed to dioxins. She urges the committee members to vote for SB 199.

Dwight Marshall, American Lung Association, said he was a member of the board of directors of the American Lung Association of Montana, and of the medical advisory section of the American Thoracic Society. The American Lung Association is a nationwide organization founded in 1904 whose mission is the prevention and control of lung disease. The American Thoracic Society is an 11,000 member international society of physicians and scientists. He said he was in favor of SB 199 which would set up siting criteria for the burning of hazardous waste. EXHIBIT 4.

Pat Tallent, resident of Montana City, said she supports SB 199 because her children attend the Montana City School, which is only one-half mile from the facility that is proposing to burn hazardous waste. She said the Ash Grove Cement plant was cited for 32 violations from April of 1993 to October of 1994, by the Air Quality Division. **EXHIBIT 5.** 

Rachael Sirs, said she was a resident of Saddle Mountain and their children attended the Montana City School, which is one-half mile from the Ash Grove Cement plant. She said she was a member of the Hazardous Waste Management Working Group of the Environmental Quality Council during the 1993 Legislative Session. The Department of Health and Environmental Science presented the "1993 Hazardous Waste Capacity Assurance Plan for the State of Montana." The report is attached to her testimony as contained in EXHIBIT 6.

Allen LeFohn, PhD, said he resides in Clancy, Montana, and has spent 26 years researching exposure-response relationships describing the effects of air pollutants. Dr. LeFohn said he had published over 150 peer-reviewed papers and technical reports, edited four books, and presented oral papers on the effects of burning hazardous waste. He said there are too many uncertainties that risk assessment cannot address. It is important that Montana's citizens, through the legislative and executive process, be guaranteed that the risks to humans and the environment associated with the emissions from new and retrofitted facilities that burn hazardous wastes are kept to a minimum. The adoption of a citing criteria will provide that guarantee. He said that in July of 1987 a major air pollutant event occurred at the Montana City School playground that contained the highest level of sulphur dioxide in the entire

United States. Ash Grove Cement Plant was never cited for that violation.

{Tape: 1; Side: B}

Dr. LeFohn asked the committee to please protect the children of Montana and pass SB 199. EXHIBIT 7.

Mike Cok, Montana Dairigold, Bozeman, said that milk that is produced in the state is highly susceptible to anything the animals eat that is in the grass, including dioxins. He said if there is a hazardous waste burner in the area, particularly a cement kiln, the dioxins will contaminate the milk and affect the milk industry. Mr. Cok said in 1989, in the Netherlands where they burn hazardous waste, dangerous levels of dioxins were found in the milk. Most of what they produced had to be destroyed. The compensation to those dairy farmers cost the government 17 million guilders; the government hopes to recoup that amount from the combustion plant operator. EXHIBIT 8.

Les Graham, Montana Dairymen's Association said they support SB 199 for the reasons previously stated.

Maureen Schwinden, representing Women Involved in Farm Economics, said they were in favor of protecting the land, air, and water, and support SB 199.

Mike Heffner, Farmer Rancher, Bozeman, said his concerns were the same as those of Montana Dairigold, and he supports SB 199.

Ed Hall, Jefferson County Planning Board said he was a proponent of SB 199. He said it was important to protect the economy and environment of the state from dioxins, and he supports previous testimony.

Mary Kepler, President, Montana City School Parent Teachers Association, said they were in support of SB 199. She presented a letter from Jean Curtiss, Legislative Chairman for the Montana PTSA/PTA. EXHIBIT 9.

Ms. Kepler said in 1994 the delegates of the Montana PTSA Convention passed a resolution on Incineration of Hazardous Waste in Cement Kilns. EXHIBIT 10.

Annette Cade, Board Member, Montana City School, said she was in support of SB 199. Burning hazardous waste is a public health issue and has become a victim of incomplete science. She said there are 2 principles that always fall true, 1) what goes in, comes out, and 2) what goes up, comes down. That is clearly demonstrated by the East Helena Superfund for lead contamination in the ground. The children at the Montana City School, at recess, had been rained upon by emissions from the Ash Grove Cement plant, which caused their scalps and skin to burn. That

is the reason why they are so concerned, and do not believe the state regulations provide the safety that is necessary.

Sarah Barnhard, representing Montanans Against Toxic Burning, said that if Ash Grove is not permitted, the Columbia Falls Aluminum Plant will have to ship their potliner to Arkansas to be disposed of. The Barnard Construction Company of Bozeman is pursuing the establishment of a facility that would recycle potliners. She said it was absurd to assume that Columbia Falls must send their potliner to Ash Grove to remain economically viable, when enterprising business people are working on real solutions by recycling and making products. EXHIBIT 11.

Ms. Barnhard said she received a letter from the Washington Department of Ecology which stated that Columbia Falls Aluminum was no longer associated with the MetWool project in the State of Washington. The letter explains that there was another company in Washington pursuing plans to use vitrification technology to produce glass products. Exhibit 11a. She urges the support of SB 199.

Willa Hall, representing the League of Women Voters of Montana, said they were concerned about the burning of hazardous waste. If a plant is authorized, the site and location that poses the least amount of risk to public health should be considered. EXHIBIT 12.

Ann Hedges, Montana Environmental Information Center, said there was a lot of testimony given as to why SB 199 should be supported. She stated that the dust from hazardous waste burning kilns has higher levels of dioxin by more than one order of magnitude than in cement kiln dust from nonhazardous waste burning kilns, and that dioxin is a probable carcinogen. She said dioxins cause other serious health problems besides cancer. There was an increased incidence of the reproductive disease endometriosis in a colony of rhesus monkeys that were exposed to dioxin for a period of 4 years. After 10 years of dioxin treatment, the presence of endometriosis was still documented. EXHIBIT 13, 14.

Cindy Morey, speaking for her husband and two children asked the committee members if they would like 30 million pounds of hazardous waste burned in a 30 year old accident prone incinerator near your child's school and home. She said "the air we breathe is our most common denominator, it doesn't follow creed, color, gender or party lines." She urged support of SB 199. EXHIBIT 15.

{Tape: ; Side: ; Approx. Counter: ; Comments: the following proponents did not have time to testify, but turned in written testimony.}

Bill Allen, Montana Audubon Legislative Fund, said they strongly support SB 199. EXHIBIT 16.

Paul Smietanka, Clancy, said regardless of any state or federal standards regarding the burning of hazardous waste, there are scientific arguments justifying the safety of hazardous waste incineration. He said they don't know what the long term effects would be at Montana City with the burning of hazardous waste. EXHIBIT 17.

Ann Johnson, representing Montanans Against Toxic Burning, Bozeman, said they were against toxic burning and urge support of SB 199. EXHIBIT 18.

J. V. Bennett, represerting the Montana Public Interest Research Group, said they were in support of SB 199 and requested that language be added that would protect agricultural lands and surface water. EXHIBIT 19.

Kane and Anita Quenemoen, Clancy, support SB 199.

Maggie Pittman, Clancy, supports SB 199. EXHIBIT 21.

Dan Pittman, Clancy, supports SB 199. EXHIBIT 22.

Tony Schooner, supports SB 199.

Pamella Collins, South Hills, supports SB 199. EXHIBIT 23.

Judy Beck, Saddle Mountain, supports SB 199. EXHIBIT 24.

Mary Ann Wellbank, Clancy, supports SB 199. EXHIBIT 25.

Brad Daggy, Clancy, supports SB 199. EXHIBIT 26.

Jacquelin Daggy, Clancy, supports SB 199. EXHIBIT 27.

Barry Johnson, PhD., Assistant Administrator, Toxic Substances and Disease Registry, submitted written testimony supporting SB 199. EXHIBIT 28.

Gary Chilcott, representing Sure-Way, said they have been working on medical waste for 6 years to come up with a solution that will not harm the environment. He said all parties should work together to find a solution.

# Opponents' Testimony:

Tom Daubert, representing Ash Grove Cement Company, said he was not attending the hearing to criticize the survey of the voters of Jefferson County. That survey represents about 5% of the registered voters. It is clear that is a minority of the voters. Mr. Daubert said he realized that those against SB 199 had serious concerns about affecting public health. He said the

state and federal environmental rules and regulations concerning hazardous waste are the most rigorous in the world.

{Tape: 2; Side: A}

Mr. Daubert presented some graphs to the committee members showing the out-of-state shipments of hazardous waste in 1992. He presented a chart showing the potential fuel that hazardous waste could produce in an incinerator. EXHIBIT 29.

Eric Hansen, Vice President of Technology, Ash Grove Cement Company, said he understood the concerns of the citizens of Jefferson County, because hazardous waste burning is a public health issue. He said he believed that the cement kiln plays an important role in the management of those waste materials. He said the EPA has done a tremendous amount of research on the effects of dioxin. Their study has shown that if a high temperature is used, there is very little emission of dioxins. Ash Grove's report to the EPA shows that Ash Grove can comply with the strictest emission standards.

Gregg Rigo PhD., Environmental Consultant, Ash Grove Cement Company, said he had more than 23 years experience as a mechanical and environmental engineer, researcher and waste management practitioner. He said his work includes developing an efficient test program for acquiring and reducing valid, representative data using advanced statistical techniques. The results can then be presented to better understand waste management and equipment. Dr. Rigo said all dioxins are not produced by man as the environment contains many natural sources of dioxins. EXHIBITS 30 and 30a.

Don Ryan, Environmental Superintendent for Columbia Falls Aluminum Company, said they would like to see SB 199 voted down by the committee. He said there are better ways of accomplishing what the supporters of the bill want, while striking a balance which doesn't create an impossible climate for Montana industry in dealing with waste generation. The aluminum plant generates a hazardous waste called spent potliner, SPL. Approximately 4500 tons of that material is produced per year. The waste is 40% carbon and 60% inorganic nmaterials which are relatively nontoxic. It is listed as a hazardous waste because of small amounts of cyanide which can leach into ground water if the material is improperly handled. Mr. Ryan suggested developing a true working coalition to work actively toward mutually acceptable reclamation technologies, rather than continuing to generate legislation which results in out-of-state disposal or forces closure of state industries that can't afford to comply with the requirements. EXHIBIT 31.

{Tape: 2; Side: B}

Riley Johnson, representing The National Federation of Independent Business, Montana Chapter, said there are 4 points he would like to address regarding their opposition to SB 199, 1) small business don't want a different environmental law, 2) the existing law is already strict enough, 3) they are concerned about SB 199 changing the rules in mid-stream, and 4) the continued environmental changes are starting to cripple small business in Montana. He said, "let the current system work."

David Owen, Montana Chamber of Commerce, said by the time a facility is situated 3 miles from town, it will isolate the facility from operating effectively. He urged the committee members not to pass SB 199.

Ward Shanahan, Helena Attorney, said he was familiar with the facility and asked that the committee members consider the scientific evidence and do not pass SB 199.

George Schiller, representing the Boilermakers at Ash Grove Cement Plant, said the company employs 66 people, and asked the committee members to give the company a chance to prove itself, and that hazardous waste burning is monitored by environmental law. He urged the committee members to vote against SB 199.

Raymond Sorenson, Columbia Falls, said he was employed by the Columbia Falls Aluminum Company. He said SB 199 would prevent the cement producers in Montana from burning the company's spent potliners. Many people have genuine concerns and he shared those concerns, but he has faith in the professionalism of the Department of Health and Environmental Sciences. EXHIBIT 32.

Brad Griffin, representing Montana Tire and Implement Dealers, said they oppose SB 199 because they all generate hazardous waste, and the incineration of that waste is necessary.

Carl Schweitzer, representing the Montana Contractors
Association, said there are hundreds of contractors who generate
some kind of hazardous waste, and a solid waste facility is
needed to dispose of it. He urged the committee members to vote
against SB 199.

E. G. Lepheimer, Montana Car Dealers Association, said the need for a hazardous facility is necessary for small businesses in Montana, and opposed SB 199.

Peggy Trenk, representing the Western Environmental Trade Association, said she opposed SB 199, and urged giving the permitting process a chance to work.

Don Kilman, said for 16 years he lived in Texas and they have 2 cement plants there that burn waste fuel, and they have not polluted the environment. He urged the committee members to reject SB 199.

Curtis Garrett, Ash Grove Cement Company and a member of the Montana City Advisory Council, said he was able to travel to Chanute, Kansas where hazardous waste was incinerated. They were burning finger nail polish, oily rags, etc., with no health hazards to the community. He urged the committee members to reject SB 199.

Mr Daubert said a facility that has operated for 32 years and is important to the economics of the community, deserves to go through the permitting processes to burn hazardous waste. He said the words, "hazardous waste" sounds more frightful than fossil fuels. Let the sciences be considered for the permitting process.

{Comments: written testimony submitted .}

Jerry Noble, owner of a Tire Dealership in Great Falls, recommended DO NOT PASS SB 199. EXHIBIT 33.

Fritz Daily, Butte, presented written testimony on "Berkeley Pit Facts and Statistics." EXHIBIT 34.

John & Debby Murray, Saddle Mountain, presented a written comparative market analysis on property within the proposed hazardous waste site. EXHIBIT 35.

# Questions From Committee Members and Responses:

SEN. WELDON asked Mr. Hanson when they talk about risk assessment, what does that mean. Mr. Hanson said risk assessment is a common screening assessment performed for example by meteorologists at the airport in Helena and Great Falls, and by Asarco to monitor emissions in the air. The information is not gathered at the Montana City facility. He said the wind direction is generally from the southeast going towards Helena, not the Montana City School.

{Tape: 2; Side: B; Comments: tape is staticy and garbled.}

SEN. WELDON said the Ash Grove Cement Plant does not have the ability to test for dioxins, and the state's laboratory does not have the ability to test for dioxins. Apparently the testing would have to be done somewhere else. He asked what the turn around time was for the report.

Jan Sensibaugh, Department of Health and Environmental Sciences said they had to write a contract with an outside laboratory. She said she didn't have any idea what the time frame would be.

SEN. VIVIAN BROOKE asked Dr. LeFohn what the difference was between natural dioxins and dioxins from emissions. Dr. LeFohn said dioxins are not all man-made. Dioxins are found in living organisms in fields, brush, forest fires, electricity, etc. The

different kinds of contributors have different percentages of dioxins.

**SEN. MACK COLE** said he was looking at the chart and wondered if Montana was shipping waste all the way to Texas. **Mr. Hansen** said that in 1992 most of the waste was shipped to Idaho and after that it was shipped to the cement kiln in Texas.

SEN. COLE asked what proportion of the waste is taken care of in Montana. Mr. Hansen said 65% of the waste was shipped out of state.

SEN. WILLIAM CRISMORE said the cement plant is 32 years old, he asked if Mr. Hansen would comment on that. Mr. Hanson said, that is true, but it is constantly upgraded for the latest scientific technology. The facility was upgraded 4 years ago to make different kinds of cement.

{Tape: 3; Side:A}

**SEN. TOM KEATING** asked if the burning of potliners degraded to cyanide. **Mr. Ryan** said that produces a small amount of cyanide.

SEN. KEATING asked Mr. Ryan if sunlight destroyed cyanide. Mr. Ryan said that is true, sunlight decomposes cyanide.

### Closing by Sponsor:

SEN. FOSTER said in looking at the western region of the United States, there is an over-capacity of hazardous waste disposal possibilities. All states can send their waste to wherever they choose. He said in Utah the buffer zone for hazardous waste incineration is 5 miles, and the Montana proposal was 3 miles. There are so many scientific facts concerning hazardous waste, that it leaves an element of uncertainty. The residents of Montana City chose to live near a cement plant, not near a hazardous waste incinerator. SEN. FOSTER thanked everyone for a good hearing and looked forward to seeing them at the executive session.

{Comments: the committee meeting was recorded on tapes 1, 2 and Side A of tape 3}

# SENATE NATURAL RESOURCES COMMITTEE January 30, 1995 Page 11 of 11

# **ADJOURNMENT**

Adjournment: 3:00 PM

LORENTS GROSFIELD, Chairman

THEDA ROSSBERG, Secretary

LG/tr

# MONTANA SENATE 1995 LEGISLATURE NATURAL RESOURCES COMMITTEE

ROLL CALL

SEN

DATE 1-30-95

NAME	PRESENT	ABSENT	EXCUSED
VIVIAN BROOKE	V		
B.F. "CHRIS" CHRISTIAENS	V.		
MACK COLE	i i		
WILLIAM CRISMORE	\ \ \ \ \		
MIKE FOSTER	V		
TOM KEATING	<i>\rangle</i>		
KEN MILLER	V		
JEFF WELDON	V		
BILL WILSON	·/		
LARRY TVEIT, VICE CHAIRMAN		, ,	4
LORENTS GROSFIELD, CHAIRMAN	V		

SEN:1995

wp.rollcall.man CS-09

DATE 1-30-95
ETH NO SB-199

# SURVEY RESULTS BURNING OF HAZARDOUS WASTE

# by Senator-Elect MIKE FOSTER December 14, 1994

# Montana City

# SURVEY - BURNING OF HAZARDOUS WASTE

	Registered Voters - North Jefferson of by Representative Mike Foster, Candidate for S	County	,	10%Tr (CO)
	414 N. Cedar, Townsend, MT 59 October 1994	) <b>644</b> , թբ	TE	-30 -9 5B-19
1.	In which school district do you live? 100	o Montana C	ity	_ Clancy
2.	Do you have any children attending school in Montai	na City? 4 <u>3.0</u>	%Yes	56.1%No
3.	Do you have any children attending school in Clancy	y?	Yes	No
4.	How long have you lived in this part of Jefferson Co 5.6% 1-2 years 36.4%2-5 years 54.2% more th	ounty? 3 <u>.7%</u> les nan 5 years	s than	1 year
5.	During the 1993 legislative session, did you support "siting" bill that would have disallowed the burning certain distance of schools and surface water? 67.0% 2.8% Not living in this area at that time	of hazardou	s waste	within a
6.	Do you believe that hazardous waste can be burned s plant near Montana City? 27.12 Yes 63.6% No	afely at the A	sh Grov tain	e cement
7.	On a scale of 1 to 5, please rank the issue of the by your personal list of priorities for the 1995 legislative $5 = 10$ lowest priority): $58.5\%1$ 12.3% 2 14.2% 3 2.8%	e session $(1 =$		
8.	Do you believe the legislature should pass a "siting" be Bill 338 from the 1993 session) during the 1995 session the effect of disallowing hazardous waste to be burn plant? 69.2% Yes 29.0% No 1.9% Uncert	on that would ned at the A	l essenti	ally have
9.	Would you support a bill in the 1995 legislative sess things as tightening permitting requirements, requiring adopting the findings of the Community Advisory Cou Management Working Group of the Environmental Community States 36.420 No 17.826 Uncertain	ng continuous ıncil and the I	monito Hazardo	ring, and
10.	of the two legislative approaches explained in quest would you most support? 57.0%#8 ("siting" bill) / continuous monitoring, etc.) /0.3% Both #8 and /0.3% Neither #8 nor #9 3.7% Uncertain	tions #8 and / <u>8.72</u> ,#9 (ti <sub>j</sub> #9 about the	#9 aborghter pe	ve, which ermitting, or equally

# Clancy/ Jefferson City

# SURVEY - BURNING OF HAZARDOUS WASTE

Registered Voters - North Jefferson County by Representative Mike Foster, Candidate for Senate District 20ATURAL RESOURCES 414 N. Cedar, Townsend, MT 59644 EXHIBIT NO. October 1994 Montana City /00/Clancy 1. In which school district do you live? 2. Do you have any children attending school in Montana City? Yes No 29.4% Yes 70.69 No Do you have any children attending school in Clancy? 3. How long have you lived in this part of Jefferson County? 4.4% less than 1 year 2.9% 1-2 years 14.7% 2-5 years 77.92 more than 5 years 4. 5. During the 1993 legislative session, did you support Senate Bill 338, which was a "siting" bill that would have disallowed the burning of hazardous waste within a certain distance of schools and surface water? 35.9 Yes 50.0 No 9.4% Neutral 4.7% Not living in this area at that time Do you believe that hazardous waste can be burned safely at the Ash Grove cement 6. plant near Montana City?55.9%Yes 32.2%No 5.9% Uncertain 7. On a scale of 1 to 5, please rank the issue of the burning of hazardous waste on your personal list of priorities for the 1995 legislative session (1 = highest priority;5 = lowest priority): 29.9%1 16.4%2 16.4%3 16.4%4 20.9%58. Do you believe the legislature should pass a "siting" bill (probably similar to Senate Bill 338 from the 1993 session) during the 1995 session that would essentially have the effect of disallowing hazardous waste to be burned at the Ash Grove cement 41.2%Yes 57.4%No 1.5% Uncertain plant? 9. Would you support a bill in the 1995 legislative session that would call for such things as tightening permitting requirements, requiring continuous monitoring, and adopting the findings of the Community Advisory Council and the Hazardous Waste Management Working Group of the Environmental Quality Council? 30.9%No 25.0% Uncertain 44.1% Yes Of the two legislative approaches explained in questions #8 and #9 above, which 10. would you most support? 30.9% #8 ("siting" bill) 35.3% #9 (tighter permitting, continuous monitoring, etc.) 7.4% Both #8 and #9 about the same or equally 1/.8% Neither #8 nor #9 14.7%Uncertain

# Totals

# SURVEY - BURNING OF HAZARDOUS WASTE

	•		_	
	Registered Voters - North J by Representative Mike Foster, Candi	Jefferson County idate for Senate D	Dis <b>trica Zo</b> natural	RESOURCE
	414 N. Cedar, Townsend	d, MT 59644	EXHIBIT NO	
	October 199	4	DATE /- 3	3095
			DATE	
		^	EILL NO. B.	199
1.	In which school district do you live?	6 <u>1.1%</u> Monta	EILL NO	ancy
2.	Do you have any children attending school	in Montana City?	26.9% Yes 34.39	2 No
			_	

- 3. Do you have any children attending school in Clancy? 1/(4%) Yes 27.4% No
- 4. How long have you lived in this part of Jefferson County? 4.0% less than 1 year 4.6% 1-2 years 28.0% 2-5 years 63.4% more than 5 years
- 5. During the 1993 legislative session, did you support Senate Bill 338, which was a "siting" bill that would have disallowed the burning of hazardous waste within a certain distance of schools and surface water? 55.3%Yes 34.7%No 65%Neutral 3.5%Not living in this area at that time
- 6. Do you believe that hazardous waste can be burned safely at the Ash Grove cement plant near Montana City?3%.3%Yes 53.7%No 8.0% Uncertain
- 7. On a scale of 1 to 5, please rank the issue of the burning of hazardous waste on your personal list of priorities for the 1995 legislative session (1 = highest priority; 5 = lowest priority): 47.421 /3.122 /5.023 8.124 /5.625
- 8. Do you believe the legislature should pass a "siting" bill (probably similar to Senate Bill 338 from the 1993 session) during the 1995 session that would essentially have the effect of disallowing hazardous waste to be burned at the Ash Grove cement plant? 58.3% Yes 40.0% No 1.7% Uncertain
- 9. Would you support a bill in the 1995 legislative session that would call for such things as tightening permitting requirements, requiring continuous monitoring, and adopting the findings of the Community Advisory Council and the Hazardous Waste Management Working Group of the Environmental Quality Council?

  45.1% Yes 34.3% No 20.6% Uncertain
- 10. Of the two legislative approaches explained in questions #8 and #9 above, which would you most support? \( \frac{1}{2.92} \)#8 ("siting" bill) \( \frac{25.12}{2} \)#9 (tighter permitting, continuous monitoring, etc.) \( \frac{9.12}{2} \) Both #8 and #9 about the same or equally \( \lambda \)\_9 \( \frac{9}{2} \) Neither #8 nor #9 \( \frac{8.02}{2} \) Uncertain

EXHIBIT NO. / a

DATE /- 30-95

BILL NO. SB-190

# **Summary of Fall 1994 Voter Survey Results**

JEFFERSON CITY CLANCY MONTANA CITY

MONTANA CITY Only

Total registered voters who received the single-issue survey

2,480

1,401

Total who cared enough about the issue to respond

175 (7%)

107 (7.6%)

Total who oppose Ash Grove, support siting bill

102 (4.1%)

74 (5.2%)

Montana City Elementary School Penny Koke, Superintendent Dianne Delaney, Principal 10 McClellan Creek Road Clancy, Montana 59634 Telephone: 442-6779

January 20, 1995

CLAMATE NATURAL RESOURCES

CHEST NO. 2

DATE /-30-95

BILL NO. 58-199

Senator Mike Foster Senate Chambers Capitol Station Helena, MT 59620

Dear Senator Foster:

The Montana City School District #27 Board of Trustees strongly supports SB 199, Requirements for Commercial Hazardous Waste Incinerators. Ash Grove Cement Company proposes to burn millions of pounds of hazardous waste one-half mile from Montana City School. The school and playground environment are the recipients of the stack emissions. The emissions from incineration of hazardous waste will include products of incomplete combustion as well as unacceptable amounts of organic chemicals, pollutants, heavy metals and ash. The processing of hazardous waste in cement kilns has not been shown to be safe beyond a reasonable doubt. Cement kilns are designed to make cement and not designed to destroy hazardous waste. Since the long term health consequences of the inhalation and ingestion of the emissions are adverse or unknown and since the Board of Trustees is charged with protecting the welfare of the students of District 27, we recommend that the requirements include a regulation that any facility burning hazardous waste be located a minimum of three miles from any school. Until substantial evidence proves that there are no adverse health effects we remain committed to banning the combustion of hazardous waste one-half mile from our school. We hope to be involved and informed about the rules and regulations as they would greatly concern and affect our community.

Sincerely,

The Montana City School Board of Trustees:

James B. Obie, Chairperson

Sandra Goodwin, Vice-Chairperson

1) Rie

R. Wayne Robinson

Gordon Tallent

Annette Cáde

# SENATE NATURAL RESIDENCE

EXHIBIT NO. DATE / 370 95 BULKNO 3 S B C 91 HEEDBACK FORM

Northernelterson County should be

omments and the second second

heiproposed Zoning Regulation for this area of Northern Jefferson County should be idopted by the Jefferson County Commissioner

The Planning Board's recommended amendments to the proposed Zoning Regulation should be adopted ...

1) The local vicinity planning group should submit a written plan for routine planning meetings in consideration of changing conditions and circumstances.

written;plan must include approcess of notification to people within the vicini for public input

The Commission should consider the thirty-day cessation period too shorts.

particular zoning regulation should be re-evaluated by the County ussioners every two years to assess its compatibility with current know ment storage disposal or incineration of a hazardous waste by a facility.

Yes

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# AMERICAN LUNG ASSOCIATION OF MONTANA CLASS 58 199

Testimony before the Senate Natural Resources Committee in Support of SB 199 January 30, 1995

Mr. Chairman and members of the committee, my name is Dwight Marshall and I am a member of the board of directors of the American Lung Association of Montana. The American Lung Association is a nationwide organization founded in 1904 whose mission is the prevention and control of lung disease. Our medical advisory section, the American Thoracic Society, is an 11,000-member international society of physicians and scientists. I come before you today to speak in favor of Senate Bill 199 which would set up siting criteria for the burning of hazardous waste.

Our interest in this issue is simply this: we believe that the potential public health impact of burning hazardous waste, especially near schools and residences, is illadvised and this measure would help protect the health of Montanans from the dangers associated with this activity.

And when the hazardous waste is burned in cement kilns, it becomes a particularly problematic activity from a public health standpoint. This is why.

In 1993, the EPA published its <u>Report to Congress on Cement Kiln Dust</u>. Among the findings in this report that were especially troubling to the American Lung Association were those that related to the air pollution caused by cement kiln dust, the by-product of the manufacturing process, and the toxic substances that are found in this dust when the cement plant burns hazardous waste.

This is what the EPA report on cement kiln dust found. First, data from the report showed that most cement kiln dust can be classified as fine particulates, those that are easily breathed deeply into the lungs. Second, the report found that common disposal practices for cement kiln dust, including dumping the dust in exposed, unlined piles, abandoned quarries and landfills have caused contamination of air and nearby surface and ground water. Third, the smallest particles may not be fully captured by air pollution control devices, even when they are operating effectively, and may instead be released into the atmosphere. And, finally, when cement kilns burn hazardous waste, certain heavy metals, including lead, arsenic and mercury, to name a few, are found in significantly higher concentrations in the cement kiln dust.

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January 30, 1995

Senate
Natural Resource Committee
RE: SB199

Dear Senators:

My name is Pat Tallent, and I would like to express my support of SB199. This bill is of utmost importance to me since my family lives in Montana City, and my children attend school only one half mile from where this facility proposes to incinerate hazardous waste.

There are numerous reasons why this bill is essential, not only for the residents of Montana City, but for the entire state of Montana. You will hear many of those reasons today, but I would like to elaborate on the record of the three facilities owned by Ash Grove that currently burn hazardous waste. I will summarize the more serious problems these plants have experienced and the serious violations pending against Ash Grove.

First, their Louisville, Nebraska plant has a \$1,274,900.00 fine pending for gross violations found during inspections in July and December of 1992. These violations include: solid waste containers were in very poor condition and their contents were likely to spill into areas which have no secondary containment; some of these containers were leaking; the automatic waste feed cut-offs were not operable for four essential functions; hazardous waste being burned prior to metal analysis; kiln operators were not provided training to ensure compliance with requirements 40CFR266 subpart H; failure to adequately inspect solid storage area; waste analysis plan does not provide for analysis of waste cement kiln dust; and in at least one instance the cement kiln dust was placed on the ground prior to waste analysis and this dust showed high concentrations of lead.

Records at Ash Grove's plant in Foreman Arkansas show that on June 12, 1992 twenty-six tons of liquid waste was burned before full analysis had been done, and this was the heavy metal analysis; on May12, 1993 an alarm system was turned off, and the facility burned out of compliance for over three hours. A June 2-3, 1994 inspection show that: there was failure to transfer hazardous waste from a leaking container; there was improper handling and storing of containers of hazardous waste which may cause them to leak; there was failure to keep ignitable waste away from sources of ignition; and using a consulting lab which is not certified in the state of Arkansas to perform analysis which results are to be submitted to the state.

# RECENT ASH GROVE OPERATOR AND MECHANICAL PROBLEMSTE.

E:11 NO SB-199: Grove facility in Montana City. This lists only covers those events that occurred between April 1993 through January 5, 1995. The ESP is the only air pollution control device on the Ash Grove cement kiln. When the ESP is tripped off The following is a list of incidents leading to the shut off of the Electrostatic Precipitator (ESP) at the Ash untreated air emissions from the kiln enter the environment.

Department of Health and Environmental Sciences, the reason(s) for the shut off, the duration that the ESP was shut off substance including heavy metals or dioxins. Emissions of airborne particulate matter from facilities like Ash Grove should not exceed 20% according to state law. and the resulting opacity. Opacity is the amount of light obscured by the plume. These particulates could contain any The following table lists the day and time an event occurred, the day the event was reported to the state

This list does not account for accidents that occur at the kiln that are not required to be reported to the state Air Quality Division such as the October fire that burned for approximately 1/2 hour. The fire was caused by a ruptured

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OPACIT	85%	100%	100%	%001	100%
DURATION OPACITY	2.5 mins.	30 seconds	4 mins.	30 seconds	2 mins.
PROBLEM	Erratic fuel feed due to malfunction of coal feed belt.	Control was switching fuel from coal to coke, which has higher Btu value. CO became elevated and O2 dropped, automatically tripping the precipitator.	The kiln feed flow meter was in the process of being repaired when a fuels spike was experienced, overfeeding fuel into the kiln. The fuel spike caused elevation in CO and a decrease in 02 which tripped the precipitator. The kiln was slowed to 12 revolutions/min. and 1 line of gas was cut.	Main stack kiln draft was interrupted by a build up of materials in one section of the kiln. Reduced draft caused a drop in 02 concentration and a subsequent CO spike.	The coal bin was low on coal, when the vibrator engaged, the remaining coal flushed onto the feed belt. This rush of fuel caused high CO levels and low 02 levels in the kiln, which tripped the precipitator.
DATE REPORTED	Jan. 5, 1995	Nov. 29, 1994	Same day	Nov. I, 1994	Oct. 27, 1994
EVENT DATE & TIME	Jan. 4, 1995 11:31 a.m.	Nov. 28, 1994 10:34 a.m.	Nov. 14, 1994 12:40 a.m.	Nov. 1, 1994 4:19 p.m.	Oct. 25, 1994 11:17 p.m.

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An interruption of the pitch fuel feed resulted in a loss at temperature in clinkering zone of the kiln causing the kin to feed un-clinkered, dusty material into the clinker cooler.	ESP outage due to a processor fault which cut power to the entire back half of the plant (EPA, dust screw conveyors, ID fan, etc.).	SP tripped three times.  Fuel feed gear pump failed feeding too much petroleum pitch (fuel) into the kiln causing excessive CO in kiln.  To avoid an explosion the ESP was automatically shut off.  Fuel feed gear pump failed again feeding too much fuel into the kiln. ESP shut off to avoid explosion.  Fuel feed gear pump failed again feeding too much fuel into the kiln. ESP shut off to avoid explosion.	vent in continuous emission monitor (CEM) room opened on a hot day and CEM overheated.  Ous emission monitor (CEM) failed. ESP cally shut off.	down material built up on the inside of the kiln sed causing an obstruction and decrease in air This led to high CO levels in kiln. To avoid an ion the ESP was automatically shut off.	Some bricking inside the kiln became displaced, causing an emergency shutdown for repairs.		
An interruption of the <b>pitch</b> fuel feed resulted in a loss temperature in clinkering zone of the kiln causing the kileed un-clinkered, dusty material into the clinker cooler.	noon	cally mu	CEM ted.	Kiln operating at too high a temperature. As it was cooled down material built up on the inside of the kil collapsed causing an obstruction and decrease in air flow. This led to high CO levels in kiln. To avoid an explosion the ESP was automatically shut off. As kiln continued to cool and same thing happened again.	l, cau		the
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inter pera I un-	ESP outage centire back h	<ul> <li>ESP tripped three times.</li> <li>Fuel feed gear pump failed feeding too much pitch (fuel) into the kiln causing excessive Consideration and explosion the ESP was automatic off.</li> <li>Fuel feed gear pump failed again feeding too into the kiln. ESP shut off to avoid explosion.</li> <li>Fuel feed gear pump failed again feeding too into the kiln. ESP shut off to avoid explosion.</li> </ul>	Cooling vent in continuous emission monitor (CEN was not opened on a hot day and CEM overheated. Continuous emission monitor (CEM) failed. ESP automatically shut off.	Kiln operating at too high a temperature. As it cooled down material built up on the inside of collapsed causing an obstruction and decrease flow. This led to high CO levels in kiln. To avexplosion the ESP was automatically shut off. As kiln continued to cool and same thing happ again.	Some bricking inside the kiln bec emergency shutdown for repairs.	Lost the controls of the kiln including the ESP	The ESP first section was taken down to adjust the amperage.
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San	DHES same d written from cc in file.	Citizen on day on day on day on day on day of the plant to plant to investig Written compan	Detailed info. c event given by company to DHES Aug. 3.	No notification by company until Aug. 3, more than one month after regulatory deadline for notification.	Same day	Jan. 3, 1993	Not reported- Citizen complaint
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In Chanute, Kansas, in 1991 the Ash Grove plant released 182,500 pounds of lead, most of which was released into the ground when kiln dust was dumped on land near the plant (180,000 lbs.). The plant manager said releases from the company increased in 1991 because the plant was using more hazardous waste fuels. This facility is currently facing a fine of \$301,727.00. Pending violations there include: failure to continuously monitor and record metal feed rates. These metals include carcinogenic metals and lead, and records show that Ash Grove failed to monitor and record these rates for one hundred twenty-eight days between 8/21/91 and 3/13/92. Another violation is for failure to record operating conditions. Ash Grove must be sure certain conditions are met before burning hazardous waste. These conditions include concentration of oxygen, making sure carbon monoxide levels and hydrocarbons do not exceed certain rates. These conditions are of <u>utmost importance</u> in controlling hazardous waste emissions and Ash Grove failed to monitor these conditions. Yet another violation is failure to analyze waste-derived fuel prior to burning.

The facility here in Montana City has also experienced many problems. In May of 1990, the Environmental Protection Agency (EPA) identified Ash Grove as a "significant violator" because the facility was out of compliance for particulate matter emissions (during a Feb. 24, 1990 test, particulate emissions were 169.6 lbs. per hour when standards allow up to 90 lbs. per hour). In June and August of 1990 this plant had discharges (spills) into Prickly Pear Creek. From April of 1993 through October of 1994 there were 32 reported violations of opacity from the state Air Quality Division. This means that their pollution control device, the electrostatic precipitator, shut down and uncontrolled pollution was released into the atmosphere. In the fall of 1994 there was a fire at the plant.

The purpose in detailing all of these problems is to prove that incineration of hazardous waste cannot be done in a safe manner near schools and homes. There are mechanical failures, human errors, and sometimes negligence as proven by Ash Grove's history. Allowing this company, or any company, to go through the permitting process will change none of these problems. I am convinced that we have proof enough that this type of activity must have a buffer zone to protect the people of this state. Senate Bill 199 provides this protection.

Pat Tallent 4 Starwood Drive Clancy, MT 59634 (Montana City) 442-4467 EXHIBIT NO. 6 - 1/30//95 THE ORIGINAL OF THIS DOCUMENT IS STORED AT THE HIST.SOCIETY AT 225 N.ROBERTS, HELENA MT 59620-1201 PHONE NO.444-2694

# TESTIMONY IN SUPPORT OF SB199 SENATE COMMITTEE ON NATURAL RESOURCES /- 30-95 January 30, 1995 Senate Committee of Sandary Senate Committee of Sandary Senate Committee of Senate Commit

Allen S. Lefohn, Ph.D. Clancy, Montana 59634

# **EXECUTIVE SUMMARY**

Given the large amount of uncertainty associated with characterization of the products of incomplete combustion, it is mandatory that a well-defined "buffer" zone be created to protect the public and the environment. This is our insurance policy. An analysis of major emitters in the State of Montana indicates that the largest fallout of stack emissions occurs within 5 miles of the point source. Thus, a multi-mile buffer zone is a reasonable area for providing first-level protection from the toxic emissions that may occur as a result of "upsets." As a research environmental scientist, much of my work is associated with assessing the potential impact of human activities on the environment. Even the best-designed engineering facilities fail to work as predicted. To protect human populations and the environment, it is important that a worst-case scenario be used and that we predict the consequences of engineering failure. Worst-case scenarios are not based on meeting perfect engineering requirements, but instead, on the knowledge that "upsets" occur in a non-perfect world. Risk assessment has been used to justify the burning of hazardous waste. The predictions of risk assessment should not be treated as scientific fact. There are simply too many uncertainties that risk assessment cannot address. It is important that Montana's citizens, through the legislative and executive process, be guaranteed that the risks to humans and the environment, associated with the emissions from new and retrofitted facilities that burn hazardous wastes, are kept to a minimum. The adaption of a siting criteria will provide this guarantee.

# MR. CHAIRMAN AND MEMBERS OF THE COMMITTEE:

Once again I am in a position of testifying to the Senate Natural Resources

Committee on the dangers of burning hazardous waste in cement kilns. On February 15,

1993, I testified to the Senate Natural Resources Committee on the technical concerns I

have regarding the "upsets" associated with hazardous waste burning and the possibility

of exposing humans and the environment to unexpected emissions of toxic pollutants.

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Upsets occur because of power failure, poor mixing, equipment failures, and changes in pressure due to burning reactive or explosive waste. As a follow-up to my testimony, I would like to reiterate my technical concerns about permitting hazardous waste burning facilities in Montana without appropriate siting criteria that provide for "buffer" zones to protect people and the environment from unanticipated toxic emissions.

I believe it is necessary that a "buffer" zone be implemented so that those of us who live in Montana can be protected against the emissions that will result from these "upsets." There are several important facts associated with hazardous waste burning that require the creation of buffer zones. These facts include

- Incinerators generate toxic emissions, including heavy metals such as arsenic, cadmium, mercury, chromium, and lead, that cannot be destroyed by incineration. Metals can attach to small particles in the emission gases and ultimately escape the pollution control equipment.
- New products are formed during the burning process. These chemicals are often more toxic than the original waste and include dioxins, considered to be some of the most toxic and dangerous chemicals ever tested.
- Besides dioxins, there are other dangerous chemicals formed that are the result of incomplete combustion. The products of incomplete combustion (PICs) are chemicals that were not in the original waste but are newly formed in the incinerator. These products of combustion are even more toxic than the chemicals originally burned.
- Only a small percentage (less than 20%) of the PICs have been identified in stack gases. Thus, it is realistic to expect that unrecognized organic chemicals are emitted from stack emissions. Many of these PICs may be carcinogenic, with the result that even though the engineering design is meeting EPA guidelines, the public and the environment may be exposed to air pollutants identified at a later date by the EPA as carcinogenic. Thus, a "buffer" zone is needed to

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provide the "insurance" policy that will protect the public and the environment from undefined PICs.

• Although a trial burn or test burn is required before a facility is allowed to burn hazardous waste, the burn's results are based on the removal of specifically identified chemicals (usually 4-6 chemicals). It is recognized that only a small percentage of the organics are known. Thus, the test burn will not normally provide information about the ability of the facility to reduce the emissions of the most carcinogenic organics.

Risk assessment has been used to justify the burning of hazardous waste. The predictions of risk assessment should not be treated as scientific fact. As stated in the recent draft of the National Academy of Sciences (NAS) report, Science and Judgment in Risk Assessment, "Risk assessment is a set of tools, not an end in itself." In recent years, the public has become increasingly aware of the potential threat to human health and the environment from hazardous waste incineration in cement kilns. The risk assessment analyses performed by the EPA on the WTI facility highlighted the potential for indirect routes to have greater impact than direct routes. However, because of the uncertainty associated with the risk assessment methodology, the public remains skeptical about the reliability of scientific predictions concerning possible threats to human health and the environment. This skepticism has arisen in part because scientists disagree on the assumptions and data inputs that are used in developing risk assessments.

As a result of some of this skepticism, the NAS (a) reviewed the methods used by the U.S. Environmental Protection Agency (EPA) to determine the carcinogenic risk associated with exposure to hazardous air pollutants from sources subject to Section 112 of the Clean Air Act Amendments; (b) included in its review, evaluations of the methods

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used both for estimating the carcinogenic potency of hazardous air pollutants and for estimating human exposures to these air pollutants; and (c) evaluated, to the extent practicable, risk-assessment methods for noncancer health effects for which safe thresholds might not exist. Because of its relevance to assessing the possible impact of hazardous waste burning at Montana City, I have paraphrased many of the NAS report's key findings.

It has become increasingly apparent that the process of carcinogenesis is complex, involving multiple steps and pathways. Risk assessment entails the evaluation of information on the hazardous properties of substances, on the extent of human exposure to them, and on the characterization of the resulting risk. Risk assessment is not a single, fixed method of analysis; rather, it is a systematic approach to organizing and analyzing scientific knowledge and information for potentially hazardous activities or for substances that might pose risks under specified conditions.

Risk assessment can be divided into four steps: hazard identification, dose-response assessment, exposure assessment, and risk characterization. According the NAS report, these four steps are described as follows:

- Hazard identification involves the determination of whether exposure to an agent can cause an increased incidence of an adverse health effect, such as cancer or birth defects, and characterization of the nature and strength of the evidence of causation.
- Dose-response assessment is the characterization of the relationship between exposure or dose and the incidence and severity of the adverse health effect. It includes consideration of factors that influence dose-response relationships, such as intensity and pattern of exposure and age and lifestyle variables that could affect susceptibility. It can also involve extrapolation of high-dose

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responses to low-dose responses and from animal responses to human responses.

- Exposure assessment is the determination of the intensity, frequency, and duration of actual or hypothetical exposures of humans to the agent in question. In general, concentrations of the substance can be estimated at various points from its source through the environment. An important component of exposure assessment is emission characterization, i.e., determination of the magnitude and properties of the emissions that result in exposures. This is usually accomplished by measuring and analyzing emissions, but that is not always possible. Therefore, modeling is often used instead to establish the relationship between emissions and environmental concentrations of the substance. Inputs to such a model should include data on residence and activities of the exposed population.
- Risk characterization combines the assessments of exposure and response under various exposure conditions to estimate the probability of specific harm to an exposed individual or population. To the extent feasible, this characterization should include the distribution of risk in the population. When the distribution of risk is known, it is possible to estimate the risk to individuals who are most exposed to the substance in question.

As discussed in the NAS report, a broad array of concerns has been raised concerning the reliability of using risk assessment methodology. Some of these concerns are

- The lack of scientific data quantitatively relating chemical exposure to health risks.
- The divergence of opinion within the scientific community on the merits of the underlying scientific evidence.
- The lack of conformity among reported research results needed for risk characterization--e.g., the use of different methods for describing laboratory findings, which makes it difficult to compare the data from different laboratories and apply them in risk characterizations.

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• The uncertainty of results produced by theoretical modeling, which 58-199 is used in the absence of measurements.

A key issue for those interested in assessing the impacts of the burning of hazardous waste at Montana City is the reliance on risk assessment methodology when there is not enough information available to generate risk assessments that are protective of public health and the environment. There is a large amount of uncertainty in applying risk assessment. There is extensive variation among individuals in their exposures to hazardous waste pollutants and in their susceptibilities to cancer and other health effects. In addition, as pointed out in the NAS report, there is the real possibility of interactions among pollutants in their effects on human health and on the environment; multiple exposure pathways and multiple adverse health effects must be considered.

# Some of the NAS recommendations include

- EPA should more rigorously establish the predictive accuracy and uncertainty of its methods and models and the quality of data used in risk assessment.
- EPA should develop guidelines for the amount and quality of emission information required for particular risk assessments and for estimating and reporting uncertainty in emission estimates, e.g., the predictive accuracy and uncertainty associated with each use of the health exposure models for exposure assessment.
- EPA should evaluate the Gaussian-plume models under realistic conditions of acceptable distances (based on population characteristics) to the site boundaries, complex terrain, poor plant dispersion characteristics, and the presence of other structures in the vicinity. Furthermore, EPA should consider incorporating such state-of-the-art techniques as stochastic dispersion models.

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- EPA should use a specific conservative mathematical technique to 58-199 estimate the highest exposure likely to be encountered by an individual in the exposure group of interest.
- EPA should use bounding estimates for screening assessments to determine whether further levels of analysis are necessary.
- EPA should continue to explore and, when scientifically appropriate, incorporate pharmacokinetic models of the link between exposure and biologically effective dose (i.e., dose reaching the target tissue).
- EPA should continue to use the linearized multistage model as a default option but should develop criteria for determining when information is sufficient to use an alternative extrapolation model.
- EPA should develop biologically based quantitative methods for assessing the incidence and likelihood of noncancer effects in human populations resulting from chemical exposure. These methods should incorporate information on mechanisms of action and differences in susceptibility among populations and individuals that could affect risk.
- EPA should continue to use as one of its risk-characterization metrics, upper-bound potency estimates of the probability of developing cancer due to lifetime exposure. Whenever possible, this metric should be supplemented with other descriptions of cancer potency that might more adequately reflect the uncertainty associated with the estimates.

There are many uncertainties in risk assessment. It is clear that insufficient information exists for exposure and toxicity to establish the health risks associated with all chemicals identified as hazardous pollutants. In addition, there are uncertainties pertaining to the models used. These uncertainties stem from a lack of knowledge needed to determine which scientific theory is correct for a given chemical and population at risk and thus, which assumptions should be used to derive estimates. Such uncertainties cannot be quantified on the basis of data. Unfortunately, in many cases, the EPA does not include in its estimate of risk the degree of uncertainty. Thus,

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decision-makers do not know the extent of conservatism, if any, that is provided the risk estimate. This important point was recently demonstrated when the EPA published its draft of Chapter 5 of the Air Quality Criteria for Ozone and Related Photochemical Oxidants Document (EPA/600/AP-93/004b). The uncertainty in the risk assessment estimates used to estimate ozone and its effects on vegetation was totally ignored in the analyses.

The NAS recommends in its report that formal uncertainty analysis can help to inform EPA and the public about the extent of conservatism that is embedded in the default assumptions. Uncertainty analysis is especially useful in identifying where additional research is likely to resolve major uncertainties.

Because of the lack of complete data, typical risk assessments tend to ignore the synergistic effects of the mixture of pollutants on human health. Typically, people at risk are exposed to a mixture of chemicals, each of which might be associated with an increased probability of one or more health effects. Data are often available on only one of the adverse effects (e.g., cancer) associated with each chemical. At issue is how best to characterize and estimate the potential aggregate risk posed by exposure to a mixture of toxic chemicals. Furthermore, emitted substances might be carried to and deposited on other media, such as water and soil, and cause people to be exposed via routes other than inhalation, e.g., by dermal absorption or ingestion. Although the complexities of this issue are great, the large degree of uncertainty associated with using risk assessment methodology to sort out these effects leaves much to be desired.

In conclusion, the NAS findings were dominated by four central themes

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- Because of limitations on time, resources, scientific knowledge, and available data, EPA should generally retain its conservative, default-based approach to risk assessment for screening analysis in standard-setting; however, several corrective actions are needed to make this approach more effective.
- EPA should develop and use an iterative approach to risk assessment. This will lead to an improved understanding of the relationship between risk assessment and risk management and an appropriate blending of the two.
- The iterative approach proposed by the committee allows for improvements in the default based approach by improving both models and the data used in analysis. For this approach to work properly, however, EPA needs to provide justification for its current defaults and establish a procedure that permits departures from the default options.
- When EPA reports estimates of risk to decision-makers and the public, it should present not only point estimates of risk, but also the sources and magnitudes of uncertainty associated with these estimates.

As has been emphasized, the uncertainties in applying risk assessment methodologies to estimate potential impacts to human health and the environment may be great. The NAS report states that "Scientists do not have and will not soon have reliable ways to measure carcinogenic risks to humans when exposures are small. In the absence of an ability to measure risk directly, they can offer only indirect and somewhat uncertain estimates." It is clear that common sense must prevail in determining whether governmental actions are stringent enough to adequately protect the public and the environment from exposure to cement kiln dust. Risk assessment is an important tool in determining the adequacy of the regulations, but because of the uncertainty associated with using risk assessment methodologies, the government should use extremely

conservative judgment in defining what levels protect the public health and the protect the protect the protect the public health and the protect the pr

Given the large amount of uncertainty associated with characterization of the products of incomplete combustion, it is mandatory that a well-defined "buffer" zone be created to protect the public and the environment. This is our insurance policy. An analysis of major emitters in the State of Montana indicates that the largest fallout of stack emissions occurs within 5 miles of the point source. Thus, a multi-mile buffer zone is a reasonable area for providing first-level protection from the toxic emissions that may occur as a result of "upsets."

As a research environmental scientist, much of my work is associated with assessing the potential impact of human activities on the environment. Even the best-designed engineering facilities fail to work as predicted. To protect human populations and the environment, it is important that a worst-case scenario be used and that we predict the consequences of engineering failure. Worst-case scenarios are not based on meeting perfect engineering requirements, but instead, on the knowledge that "upsets" occur in a non-perfect world. It is important that Montana's citizens, through the legislative and executive process, be guaranteed that the risks to humans and the environment, associated with the emissions from new and retrofitted facilities that burn hazardous wastes, are kept to a minimum. The adaption of a siting criteria will provide this guarantee.

SENATE NATURAL RESOURCES
EXHIBIT NO. 7
DATE 1-30-95
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# WHAT IS A HEALTH RISK ASSESSMENT

A health risk assessment is a means of describing the effect of a source on a receptor (such as school children or nearby residents) through various environmental media (air, food, water, etc.). In short, who is exposed to how much of what, coming from where, and what is the possibility of adverse effects?

# RISK ASSESSMENT: CAN THE RESULTS BE TRUSTED?

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- The possibility of synergistic interactions when multiple chemical exposures occur is many times ignored.
- Available data show extreme variability among individuals in their responses to toxic substances. This is not always taken into consideration.
- Uncertainties in the results of risk assessments are inadequately described. Risks are most often reported as "point estimates," single numbers that admit to no uncertainties. Large uncertainties are often overlooked, and descriptions of risk as "upper bounds" are misleading and simplistic.

Source: Science and Judgment in Risk Assessment. National Research Council, National Academy Press, p. 40-41 (1994).

## THE BOTTOM LINES

CEMATE NATURAL RESOURCES
EXHIBIT NO. 7
DATE 1-30-95
BILL NO. 5 13-199

- SCIENCE WILL NOT GIVE A
   DEFINITIVE ANSWER ON
   WHETHER IT WILL BE SAFE TO
   BURN HAZARDOUS WASTE AT
   THIS FACILITY.
- RISK ASSESSMENT IS A TECHNICAL TOOL WITH MUCH UNCERTAINTY.
- A HISTORY OF UPSETS EXISTS AT THIS FACILITY.
- IT IS THE RESPONSIBILITY OF ALL GOVERNMENTS (LOCAL, STATE, AND FEDERAL) TO PROTECT THE PUBLIC'S HEALTH. IF IT DOES NOT, THEN OF WHAT USE IS GOVERNMENT?

# THE RISK IN USING RISK ASSESSMENT

EXHIBIT NO. 7

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"Although Gaussian-plume models have been used for many years, their results are still subject to considerable error...Applying Gaussian-plume models in complex terrain (such as hilly areas or areas with tall buildings) leads to even greater uncertainties and can result in significant overprediction and underprediction. Their rather simple formulation makes it difficult to handle complex terrain."

Source: Science and Judgment in Risk Assessment. National Research Council, National Academy Press, p. 378 (1994).

## SENATE NATURAL RESOURCE

#### ALLEN S. LEFOHN

Dr. Allen S. Lefohn received his Ph.D. from the University of California at Berkeley.—\$ 79.199

Over the past 26 years, Dr. Lefohn's research has involved the development of exposure-response relationships describing the effects of air pollutants. He has most recently been involved in assessing the potential effects of hazardous waste-burning facilities on human health and the environment. Dr. Lefohn is the author of several high-level government reports. He was the lead author of a White House National Acid Precipitation Assessment Program (NAPAP) State-of-Science Report to Congress. His past responsibilities have included his participation as senior researcher under contract for the United Nations, U.S. Forest Service, Environment Canada, U.S. Environmental Protection Agency, and the Department of Energy. He has published over 150 peer-reviewed papers and technical reports, edited four books, and presented oral papers. He is an Executive Editor of the prestigious scientific journal Atmospheric Environment and is an Adjunct Instructor of Environmental Engineering at Montana Tech in Butte,

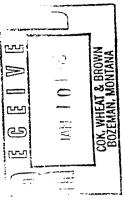
Montana. Since, 1976, he has resided with his family in Clancy, Montana.

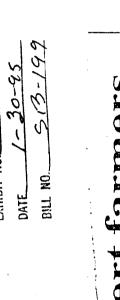
SENATE NATURAL RESOURCES EXHIBIT NO.

# Lickebaert farmers back in business

VLAARDINGEN - Dairy farmers in the Lickebaert area near Vlaardingen were celebrating this week, Production of meat and dairy products in the areas was toasting their health with glasses of their own milk esumed after having been banned for five years. In 1989, dangerous levels of dioxines were found in the milk produced by local cows. The toxics came from a nearby waste combustion plant. Although the farmers eceived compensation from the government for their proion. Most of what they produced in the past five years had to be destroyed and to many the pleasure of farming had duction losses, they were eager to get back to normal opera-

guilders, with perhaps as much again spent on tests and The compensation alone cost the government 17 million other research. It hopes to recuperate the money from the combustion plant operator.







TO: SENATE NATURAL RESOURCES COMMITTEE

FR: JEAN CURTISS, LEGISLATIVE CHAIR, MONTANA PTSA/PTA

DATE: JANUARY 27, 1995

RE: SB 199- SITING CRITERIA FOR HAZARDOUS WASTE INCINERATORS

My name is Jean Curtiss. I am the Legislative Chair for the Montana PTSA/PTA. I speak for the 11,000 members of PTA in Montana. I speak in favor of SB 199.

In April 1994, the delegates of the Montana PTSA Convention passed a resolution on <u>Incineration of Hazardous Waste in Cement Kilns</u>. I have attached a copy of this resolution. This resolution gives the Montana PTSA direction to support legislation to ban hazardous waste incineration facilities in Montana. SB 199 is a step in this direction.

The local PTA that brought this resolution to the convention body of the Montana PTSA was required to present documentation to show a need for the resolution. They developed a full three-ring binder of background material documenting the dangers of burning hazardous waste in cement kilns. This local PTA unit has reason to be concerned about these dangers because they have a cement kiln in their community, Montana City.

Some of the dangers of burning hazardous waste in a cement kiln are:

>Cement kilns do not burn hot enough to completely incineration of hazardous material.

>Cement kilns have a lot of Carbon Monoxide mainly from poor combustion

>Small amounts of the chemical wastes end up in both the cement and the dust leftovers. The dust goes into the air and much goes to landfills.

>Dioxins and even plutonium were found by EPA analysis of cement kilns.

>A thorough review of human health and environmental hazards has not been done .

>Incineration of hazardous waste using present technologies and practices cannot safely occur.

>Incinerators are waste generators themselves. When solid hazardous wastes are burned, as much as 29% remains ash and must be disposed of in landfills. This ash contains metals and unburned hazardous waste.

>Metals cannot be destroyed by incineration. In some cases, incinerators will change the physical or chemical forms of metals and actually increase their toxicity and leachability.

> Heavy metals emitted into the air can pose cancer risks to individuals living in near the facilities.

>Cement makers now earn millions as toxic waste disposers, using hazardous waste as fuel rather than paying for conventional fuels to generate the high temps needed for the kilns.

The Montana PTSA urges you to vote for SB 199 to protect Montanans from the dangers related to the incineration of hazardous waste in cement kilns. Even though the Montana PTSA would like all incineration banned, this legislation requiring a set-back location will help to reduce the exposure.

### RESOLUTION

INCINERATION OF HAZARDOUS WASTE IN CEMENT KILNS 5 B-19 S

- Whereas, Montana cement corporations have applied for Federal EPA and state permits to burn hazardous waste as a supplemental fuel; and Whereas. If the cement plants in Montana are allowed to burn the quantities of hazardous waste stated in their Part A applications, these plants will process approximately 90 million pounds of hazardous waste per year in cement kilns; and Whereas, The processing of hazardous waste in cement kilns has not been shown to be safe without reasonable doubt since cement kilns' operating parameters are designed to make cement, and not to destroy hazardous waste; and Whereas, All of these plants are located near residential communities and the Montana City School is within one half mile of a cement plant proposing the incineration of hazardous waste; and Whereas, The emissions from these plants will include thousands of pounds of products of incomplete combustion, such as dioxin, as well as unacceptable amounts of organic chemicals, pollution, heavy metals, and ash; and the long term health consequences of these emissions are adverse or unknown; and Children have been shown to have a significant increase in respiratory problems where there is an increase in Whereas, pollution; and Whereas, The cement kiln dust is not presently treated as hazardous waste as it would be if the same waste material were to be processed in hazardous waste incinerators, and will be placed in an old quarry where blowing wind could redistribute the dust to neighboring farmland, fields, and home gardens, and be deposited back into the environment where long term leaching and contamination of the groundwater could occur; and since much of Montana is farmland, the risk of contaminating water, soil, plants and the food chain is a real and potential health risk; and Whereas, Increased cancer of larynx, neuroblastomas, Parkinson's Disease and other conditions have been found to occur near hazardous waste incineration facilities; and Whereas, The transportation of this hazardous waste by either truck or rail from other areas in the United States increases risks to the public and environment; and 10) Whereas, The cement made from cement kilns using hazardous waste as fuel has not been independently shown to be safe, without risk of heavy metals leaching over time; and 11) Whereas, It is in the best interest of the children in the state of Montana in regard to their health and quality of life that cement derived from hazardous waste be banned in Montana; and 12) Whereas, The Montana Parent, Teacher, Student Association (PTSA) is committed to protecting the health and safety of the children of the state, it can in no way support the current proposals to burn hazardous waste without substantial evidence that it will cause no adverse health effects; therefore be it 1) Resolved, That the Montana PTSA express its opposition to the appropriate authorities regarding the permit applications and
- 2) Resolved, That the Montana PTSA supports:
  - a. State and federal legislation to establish a ban on hazardous waste incineration facilities in Montana; and
  - b. State and federal legislation for source reduction, re-use, and true recycling of hazardous waste; and

proposed operation of any cement corporation in using hazardous waste as fuel; and be it further

c. State and federal legislation requiring labeling of all products produced or derived from facilities using hazardous waste as a fuel source.

Testimony of Sarah Barnard Before the Montana Senate Natural Resources 1-30-95
Committee, January 30, 1995

Mr. Chairman, members of the Committee, my name is Sarah Barnard; I live in Bozeman, and I'm on the board of Montanans Against Toxic Burning. I request that this testimony be included in the official hearing record.

I'd like to make some brief comments about alternatives. Columbia Falls Aluminum representatives often forecast economic hardship if Ash Grove is not permitted - they'll have to ship their spent potliner to Arkansas to be disposed of. As if these would be the only two options. Not so.

In Washington state, the big aluminum production companies are facing the same dilemma - what to do with spent potliner in a couple years when federal standards would require more than simple landfilling of it. In Washington two potliner recycling projects are proceeding. One, MetWool of Washington, plans on recycling potliner into zinc oxide, pig iron, and mineral wool. The other company actively pursuing the establishment of a facility is, interestingly enough, a Montana company, Barnard Construction headquartered in Bozeman. They plan to use a vitrification technology to make glass products. I'm submitting a recent letter from the Washington State Department of Ecology which describes the status of these projects.

It's rather absurd to assume that Columbia Falls must send their potliner to Ash Grove to remain economically viable. Enterprising businesspeople are working on real solutions. The question is not simply what can be done with this waste, but what can be done which is both economically feasible - in this case making a product - and responsible - in this case recycling, rather than irresponsibly burning the waste near a school.

Thank you.



## STATE OF WASHINGTON

## DEPARTMENT OF ECOLOGY

P.O. Box 47600 • Olympia, Washington 98504-7600 (206) 407-6000 • TDD Only (Hearing Impaired) (206) 407-6006

January 6, 1995

XHIBIT NO. 11 a

DATE /-30-95

BILL NO. 5 B-199

1,30

Ms. Sarah Barnard 421 South 10th Bozeman, Montana 59715

Dear Ms. Barnard:

This letter is in response to your letter to Mr. Ted Mix, dated December 12, 1994. Ted asked if I would bring you up to date on the questions in your letter as I am closer to the issue.

In your letter you asked the status of the Enviroscience potliner recycling project, now known as MetWool of Washington. As you are aware, the project has passed two large regulatory hurdles. Those hurdles are represented by a favorable recycling determination and a Boiler and Industrial Furnace rule exemption. Recently, the company has chosen to locate their facility in Dallesport, Washington.

Metwool is now in the process of completing the State Environmental Policy Act checklist, which will determine whether or not an Environmental Impact Statement will be needed. In addition, Metwool is now reviewing plant designs and securing letters of intent from both suppliers of recyclable materials and purchasers of end product. No facility opening date has been set.

You also asked about other potliner recycling projects that have been proposed in this state. To date, there is one other company actively pursuing the establishment of a facility in Washington. This company plans to use a vitrification technology to produce glass products. Two other companies have proposals that are pending.

Lastly, you asked about the involvement of Columbia Falls Aluminum with the MetWool project. To my knowledge, Columbia Falls Aluminum is no longer associated with this project.

I hope this answers your questions. If you need further assistance, please feel free to contact me at (206) 407-6758.

Sincerely,

Ty Thomas

Hazardous Waste and Toxics Reduction Program

TT:nh

## League of Women Voters of Montana



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## WRITTEN TEST (MONY SUBMITTED BY THE LEAGUE OF WOMEN VOTERS OF MONTANA

Senate Natural Resources Committee . 1:00 p.m.: Monday, danuary 30, 1995 Senate Bill 1994by Foster

The League of Women Voters is concerned about the burning of Hazardous Waste if a plant is authorized, the actual site should be located in an area that poses the least amount of risk to the public, and to sensitive environmental areas such as water sources, prime agricultural land, and grazing land. Until the emission standards for cement kilns are strengthened to at least be as stringent as those for hazardous waste incinerators, we oppose their use for the burning of hazardous wastes. We would prefer the promotion of reuse and recycling of solid and hazardous wastes.

The question of whether there is a genuine need to have any hazardous wasted plant in Montana at this time is should first be addressed. If we do determine there is a need; then an economic, social, and environmental impact assessments should be conducted on any proposed site. The public should be thoroughly involved with the process

Red.Wishing process

SetThe League of Women Voters of Montana supports Senate Billy 199, although

does not address the overall picture of hazardous waste burning in our state
(equinge a do pass recommendation on S.B. 199. Thankyou.

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CITATE NATURAL RESOURCES

## MONTANA ENVIRONMENTAL INFORMATION CENTER

#### SB 199

## Testimony presented by Anne Hedges Montana Environmental Information Center

The following are just some of the reasons that MEIC believes passage of SB 199 is crucial to protect the health of Montanans and our environment.

- We know that cement kiln dust from hazardous waste burning kilns has higher levels of dioxin, often by more than one order of magnitude than in CKD from nonhazardous waste burning kilns. 1
- We know that dioxin is a probable carcinogen.
- What scientists are just discovering is that dioxin causes other very serious health effects besides cancer. For example, Dr. Sherry Rier, with the Dartmouth Medical School, found an increased incidence of the reproductive disease endometriosis in a colony of rhesus monkeys that was chronically exposed to dioxin for a period of 4 years. Ten years after termination of dioxin treatment, the presence of endometriosis was documented...The incidence of endometriosis was directly correlated with dioxin exposure and the severity of disease was dependent upon the dose administered. (Attachment 1)
- We know that certain populations are more susceptible to the effects of toxins, such as dioxin. Specifically elderly persons and persons with chronic illnesses, people of reproductive age, and most importantly infants and children are most acutely effected. Children are more susceptible because
  - they play outdoors,
  - they ingest or mouth foreign objects,
  - they are smaller than adults and therefore receive greater chemical doses per pound,
  - they breath more air than adults and so have a greater volume and breathing rate per pound,
  - they are nutritionally challenged because they have greater protein-calorie requirements to support rapid physical growth,
  - they are undergoing developmental changes that make them especially vulnerable to chemical exposures, and

P.O. Box 1184 Helena, MT 59624 (406) 443-2520

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• they have the longest life expectancies, during which long-term adverse health effects ma become manifest. Certain disorders may not become evident until a child reaches a particular developmental stage, which may occur long after the damage was done. (Attachment 2)

The easiest way to insure that those most susceptible to dioxin in the environment - such as the children at the Montana City School - are not exposed to increased levels of dioxin is to allow for a safety margin. SB 199 allows for a 3 mile safety margin. MEIC believes that the safety margin should be even greater than 3 miles but it is a good start. We urge you to pass SB 199 and protect Montanans from the dangers of dangerous substances like dioxin.

1 Report to Congress on Cement Kiln Dust. U.S. Environmental Protection Agency. December 1993, pp. 3-62.

TO

fundamental and applied toxicology 21, 433–441 (1993)

EXHIBIT NO. 14

DATE 1-30-95

BILL NO. 5 B-199

## Endometriosis in Rhesus Monkeys (Macaca mulatta) Following Chronic Exposure to 2,3,7,8-Tetrachlorodibenzo-p-dioxin

SHERRY E. RIER,\* Dan C. MARTIN,† ROBERT E. BOWMAN,‡ W. PAUL DMOWSKI,§ AND JEANNE L. BECKER\* |

\*Department of Medical Microbiology and Immunology, University of South Florida College of Medicine, Tampa, Florida 33612: \*Department of Obstetrics and Gynecology, University of Tennessee, Memphis, Tennessee 38103, \$4The Harlow Primate Laboratory, Department of Psychology, University of Wisconsin, Madison, Wisconsin 53715: \$Department of Obstetrics and Gynecology, Rush Medical College, Chicago, Illinois 60521; and \$\frac{1}{2}Department of Obstetrics and Gynecology, University of South Florida, Tampa, Florida 33606

Received June 4, 1993; accepted August 17, 1993

Endometriosis in Rhesus Monkeys (Macaca mulatta) Following Chronic Exposure to 2,3,7,8-Tetrachlorodibenzo-p-dioxin. RIER, S. E., MARTIN, D. C., BOWMAN, R. E., DMOWSKI, W. P., AND BECKER, J. L. (1993). Fundam. Appl. Toxicol. 21, 433-441.

The incidence of the reproductive disease endometriosis was determined in a colony of thesus monkeys chronically exposed to 2,3,7,8-tetrachlorodibenzo-p-dioxin (TCDD or dioxin) for a period of 4 years. Ten years after termination of dioxin treatment, the presence of endometriosis was documented by surgical laparoscopy and the severity of disease was assessed. The incidence of endometriosis was directly correlated with dioxin exposure and the severity of disease was dependent upon the dose administered (p < 0.001). Three of 7 animals exposed to 5 ppt dioxin (43%) and 5 of 7 animals exposed to 25 ppt dioxin (71%) had moderate to severe endometriosis. In contrast, the frequency of disease in the control group was 33%, similar to an overall prevalence of 30% in 304 rhesus monkeys housed at The Harlow Primate Center with no dioxin exposure. This 15-year study indicates that latent female reproductive abnormalities may be associated with dioxin exposure in the thesus. Therefore, the effects of this toxin may be more diverse than previously recognized. \$ 1993 Society of Toxicology.

Endometriosis is characterized by the growth and proliferation of endometrial cells at sites outside the uterus. Common sites of endometrial cell growth include the ovary, bladder, intestine, and pelvic peritoneum. It is generally accepted that ectopic cells either implant and proliferate following retrograde menstruation or differentiate from a primitive progenitor cell population within the abdominal cavity (Sampson, 1940; Schweppe, 1990). These endometrial cells can respond to ovarian hormones and, therefore, undergo cyclic menstrual changes with periodic bleeding. Although endometriosis is considered a benign disease, both mild and severe forms are associated with infertility, chronic pain, and extensive adhesion formation. Because

definitive diagnosis can only be made by direct visualization of the peritoneal cavity, the prevalence of endometriosis in the general population is not known. However, studies estimate that the prevalence of this disease is 10% among reproductive-age women, indicating that endometriosis may be present in 6.6 million women in this country alone! (Wheeler, 1992). Endometriosis is a serious disorder and consumes a significant proportion of health care expenses for gynecologic care. The etiology of endometriosis is unknown, but studies suggest that immune mechanisms may contribute to the disease process (Dmowski et al., 1991; Hill, 1992).

2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD or dioxin) is a potent chemical toxicant which serves as the reference compound for a large class of halogenated aromatic hydrocarbons (Poland and Knutson, 1982). Although dioxin is a carcinogen and teratogen in rodents (Kociba et al., 1978; Pratt et al., 1984; Abbott et al., 1989), the true biologic effects of this toxin in humans are not clear. Dioxin-induced effects are mediated by high-affinity binding to the aryl hydrocarbon receptor. Following receptor activation, the receptor-ligand complex is translocated to the nucleus, where DNA binding occurs resulting in transcriptional activation (Whitlock, 1990).

Target genes for the action of dioxin include cytochrome P450 and growth regulatory genes involved in both inflammation and differentiation, including plasminogen activator inhibitor-2 and interleukin-1 $\beta$  (Whitlock, 1990; Sutter et al., 1991). Dioxin also modulates various hormone receptor systems which play a role in uterine function, including estrogen receptor, progesterone receptor, epidermal growth factor receptor, and prolactin receptor (Jones et al.,

<sup>&</sup>lt;sup>1</sup> Population estimates of reproductive-age women in the United States (ages 15-49). In Statistical Abstracts of the United States, p. 14. U.S. Bureau of Census, Washington, DC, 1990.

TABLE 2

Severity of Endometriosis in Dioxin-Treated Rhesus Monkeys\*

	Acosta			AFS			τAFS <sup>Δ,ε</sup>							
Group	None	Mild	Moderate	Severe	None	1	IÌ	Ш	IV	None	I	11	111	; /1
Control	4	1	1	0	4	2	0	0	0	4	2	0	0	0
\$ ppt	2	ò	2	3	2	2	0	3	0	2	2	0	2	14
25 ppt	1	0	0	6	1	0	1	3	2	1	0	ì	1	4° °

<sup>\*</sup> Severity of disease was assessed according to the Acosta, AFS, and rAFS classification systems.

Data were analyzed according to the rAFS classification system.

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and the 3 monkeys that died of extensive endometriosis from which disease was documented and staged from autopsy notes. Animals which died prior to June 1992 of causes other than endometriosis (n - 4) were not considered in this study. Although endometriosis was not noted at autopsy, the possibility exists that disease was present which was not grossly apparent. Therefore, we have excluded these animals from the present analysis to allow conservative interpretation of these findings. (Inclusion of these animals moderately strengthens the statistical significance of the data in this report.)

Autopsy records from female rhesus monkeys housed at The Harlow Primate Laboratory were reviewed to determine the prevalence of endometriosis in the rhesus general population. This analysis included 304 normal noncastrated females \$4 years of age with no history of dioxin exposure.

Mixing and quantitation of dioxin diets. Animals were housed at the University of Wisconsin—Biotron from 1977 to 1983 and at The Harlow Primate Lab (Madison, WI) from 1983 to 1993. Diets were prepared as follows: 2.3.7.8-totrachlorodibenzo-p-dioxin was prepared as a stock solution by diluting 19.8 µg dioxin in 1.0 ml benzene. One part stock solution was then diluted with 3550 parts acctone and 200 ml of the resulting solution was mixed with 8 kg of monkey chow.4 Additional normal meal was then added to yield 22.7 kg (50 lb) of chow with a final concentration of 50 ppt dioxin. This premix (5- and 25-lb portions) was added to normal meal (final weight 50 lb) to make the 5 and 25 ppt diets, respectively. Diets were pelleted by the addition of 2 liters of water and 1 liter of glycerine per 50-lb bag, which served as binders. Dioxin-free chow was prepared for control monkeys as described above, using benzene, acetone, and glycerine. Dioxin was administered by addition to the daily allotment of 200 g of monkey chow. Food records documented that the animals consumed an average of 95% of their daily diet. Samples of 100 g from each bag of feed were frozen and assayed for quantitation of dioxin concentration. Dioxin content in the feed was verified by gas chromatograph/mass spectrophotometer (GC/MS) analysis of selected samples over the 4-year treatment wind as described (Gross of al. 1981). For the 5 and diet dioxin concen-

treatment group was expected to be uniform despite small variations in daily intake of dioxin.

Diagnostic laparoscopies. In June 1992, 17 monkeys underwent diagnostic laparoscopy in the facilities of the The Harlow Primate Laboratory. Surgeries were carried out in random order and in a blinded fashion, without knowledge of the group assignment of each animal. Laparoscopy was performed under general anesthesia maintained under the direction of a licensed veterinarian from the staff of the Wisconsin Regional Primate Research Center. Under satisfactory anesthesia using ketamine HCI (15 mg/kg), animals were prepped and draped. An umbilical injection of 5 come of 1% xylocaine was used as an additional local anesthesia. The abdominal cavity was insufflated using a 1.5 liter per minute insufflator and Veress needle until the abdomen was distended and tympanic on percussion. A 10-mm trocar was inserted into the fascia, the abdomen was lifted, and the trocar was directed behind the anterior peritoneum and inserted into the peritoneal cavity. The cavity was confirmed visually and the insufflator connected to the trocar. A 10-mm diagnostic laparescope was used to inspect the pelvic organs, the anterior peritoneum, the visible bowel sur faces, the liver edge, and the diaphragm when these were not obscured by endometriosis and/or adhesions. Clinical findings were recorded and docu mented by photography at the time of surgery. At the end of the procedure gas was evacuated from the peritoneum and the incisions were sutured. using an inverted suture. Betadine gel was placed on the incision. No postoperative complications occurred in any of the animals; the absence of infection was confirmed by normal complete blood cell counts and bloo-

The presence and severity of endometriosis was determined by human criteria, according to the Acosta, American Fertility Society (AFS), an revised AFS (rAFS) classification (Acosta et al., 1973; The American Fertility Society 1979, 1985). These universally recognized systems of classification standardize disease severity according to the number, size, and location of endometriotic implants and the presence of adhesions. Disease w documented at the time of laparoscopy (n = 17) or from autopsy notes (n = 17).

RIER ET AL

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#### RESULTS

Incidence of Endometriosis in Dioxin-Treated Rhesus
Monkeys

The data presented in Fig. 1 demonstrate that the incidence of disease in these 20 animals directly correlated with dioxin exposure. Endometriosis was present in 71 and 86% of animals in the 5 and 25 ppt groups, respectively. This was significantly different from the percentage of animals exhibiting disease in the control group (33%, p < 0.05). The severity of endometriosis was also significantly correlated with the data of dioxin administrated (Table 2: Fig. 2). By

<sup>\$</sup>p < 0.00 k 5 and 25 ppt animals compared with corresponding values for control animal group.</p>

 $<sup>^</sup>dp < 0.05$ . 5 ppt animals compared with corresponding values for control animal group.

<sup>\$\</sup>rho < 0.025, 25 ppt animals compared with corresponding values for 5 ppt animal group.</p>

#### ENDOMETRIOSIS IN RHESUS MONKEYS EXPOSED TO TCDD

scoring systems, Stage II, III, and IV disease was exclusively found in animals exposed to either 5 or 25 ppt dioxin. Furthermore, the severity of disease, as reflected by the rAFS score, was positively correlated with the daily and cumulative dose of dioxin administered.

Endometriosis occurs exclusively in menstruating species, including humans and nonhuman primates. Disease develops spontaneously in rhesus monkeys and resembles human disease anatomically and clinically (McClure, 1979; MacKenzie and Casey, 1975; Fanton and Golden, 1991). The frequency of spontaneous endometriosis in these animals was reported as 26% in a controlled study (Fanton and Golden, 1991). Disease manifestations, including intraabdominal cyst formation and adhesions involving the ovaries, urcters, colon, or urinary bladder, are similar to those seen in humans. Representative endometriotic lesions in a dioxin-treated rhesus monkey with severe disease are illustrated in Fig. 3A. These lesions are remarkably similar to those occurring in human endometriosis (Fig. 3B).

As noted in our study, other investigators have described that animals with endometriosis exhibit behavior consistent with pain, including prostration and anorexia occurring with the menses (Lindberg and Busch, 1984; Fanton et al., 1986a; Fanton et al., 1986b; Fanton and Golden, 1991). Unlike human disease, untreated endometriosis can be potentially fatal in the rhesus monkey, particularly if intestinal blockage occurs. Because endometriosis is frequently unrecognized in colonies of thesus monkeys until late stages of disease, euthanasia for humane reasons may be carried out due to severe pain (Fanton et al., 1986b; Fanton and Golden, 1991). Studies show, however, that rhesus disease may respond to appropriate surgical techniques or hormonal therapy as employed to treat human endometriosis (Fanton et al., 1986b; Mann et al., 1986). Severe, unrelenting pain is a common symptom in women with this disease (Fedele et al., 1990; Ripps and Martin, 1991).

Animal studies in numerous species demonstrate that dioxin affects female reproductive function; these effects include reduced fertility, an inability to maintain pregnancy for the full gestational period, and direct effects on female gonads (Allen et al., 1979; McNaulty, 1984; Bowman et al., 1989; Safe et al., 1991). The reproductive outcome of the rhesus monkeys included in this study has been previously reported (Bowman et al., 1989). Reproductive function of mothers exposed to 5 ppt dioxin was not signifi-

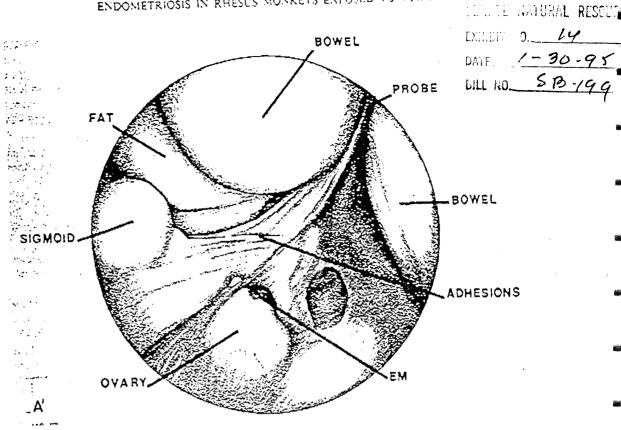
cantly different from the controlleroup, Seven of males bred after 7 months of exposure to toxin were able to conceive. Six of these females gave birth to viable infants at term and one gave birth to a stillborn infant. Seven of cight control animals were able to conceive and gave birth to live infants. In contrast, reproductive outcome was significantly compromised in animals treated with 25 ppt dioxin, the group that also exhibited the most extensive endometriosis. Although five of eight females bred in this group conceived. only one gave birth to a viable infant; there were three spontaneous abortions and one neonatal death. Although the reproductive abnormalities which occurred in these animals can be attributed to the toxic effects of dioxin in utero. these findings are in agreement with human studies which suggest a possible increase in spontaneous abortion in women with endometriosis (Damewood, 1989). These data also suggest that maternal exposure to dioxin before and during pregnancy can result in fetomortality without overt toxic effects on the mother.

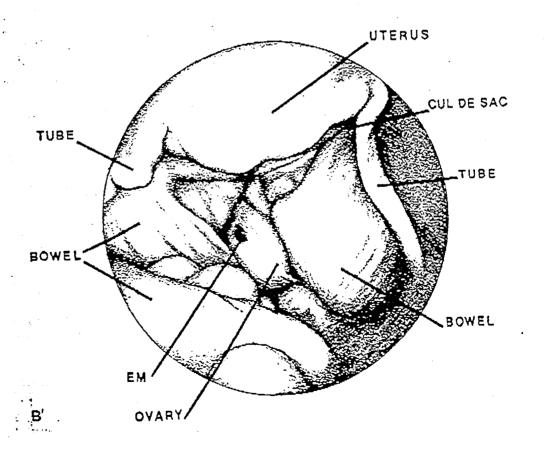
Previous work has described an association of endometriosis in rhesus monkeys following exposure to polychlorobiphenyl (PCB) compounds (Campbell et al., 1985). Our results support and extend these findings, since dioxin is used as a reference compound for halogenated aromatic hydrocarbons, including PCBs (Poland and Knutson, 1982). Extensive literature has documented the incidence of endometriosis in the rhesus model following exposure to single-energy proton irradiation, mixed-energy proton irradiation and x rays (Wood et al., 1983; Fanton and Golden, 1991; Wood, 1991). The shortest time lapsed between irradiation exposure and the development of endometriosis was 6 years (Wood, 1991). In our study, endometriosis in dioxin-exposed monkeys was first documented 7 years following the termination of dioxin treatment. Immune system defects are a common probable factor which may contribute to the development of endometriosis in each of these animal models. Indeed, this notion is consistent with human studies, suggesting that immune mechanisms may contribute to the disease process (Dmowski et al., 1991; Hill, 1992). Dioxin has immunosuppressive activities and is a potent inhibitor of T lymphocyte function (Holsapple et al., 1991; Neubert et al., 1991; Tomar and Kerkyliet, 1991). In addition, this toxin modulates steroid receptor expression resulting in altered tissue-specific responses to hormones (Safe et al., 1991). Chronic immunosuppression in

FIG. 3. Representative endometricitie lesions in rhesus monkey and human. Endometrial implants in the human and rhesus monkey are commonly associated with a reactive fibromuscular scar. This scar traps old blood and blood products and gives rise to a chronic appearance of a puckered black lesion. Endometricis (EM) present on the every of a rhesus monkey exposed to 25 ppt diexin (A, A'). The dark powderburn appearance is typical of the lesions encountered in animals with severe disease. This animal also exhibited extensive adhesion formation, extending to the sigmoid colon, as illustrated schematically. Extensive intestinal adhesions and cysts were noted in animals with severe disease, including these which died from EM. Lesions occurring in the rhesus monkey are remarkably similar to human endometricis. (B, B) Disease present on the every of a 30-year-old woman. Endometricic foci may extend beneath the surface of the lesion.

ENDOMETRIOSIS IN RHESUS MONKEYS EXPOSED TO TODD

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# New Gene Ties Cancer,

Three research groups seeking genes in different ways for very different reasons have discovered one that helps explain the development of cancer. The gene, which goes by at least three names, leads to the production of a protein that keeps cells in a resting, nondividing stage of the cell cycle. It is regulated by a tumor suppressor gene, called p53, already known to be important in keeping some cells from forming tumors (SN: 6/5/93, p.356).

"[The gene] is a missing piece [that explains] a lot of things that we didn't understand before," says James R. Smith of Baylor College of Medicine in Houston.

The new results indicate that when p53 fails to do its job, the cell stops making this new gene's protein, setting the stage for cancer. "[The results] provide a direct link between a tumor suppressor protein and the cell cycle," comments Tony Hunter, a molecular biologist at the Saik Institute in La Jolla, Calif.

Figuring out how p53 regulated the cell cycle "was sort of the Holy Grail in the tumor suppressor field," adds J. Wade Harper, a Baylor biochemist.

Smith and his colleagues had wanted to understand why old cells lose their ability to divide. They inserted pieces of DNA derived from nondividing, senescent cells into young cells that were rapidly dividing in a laboratory dish and monitored which DNA stopped cell division.

Three DNA strands had this effect on the cells. The researchers isolated a gene from the strand most active in older cells, naming it senescent-cell-derived DNA inhibitor 1 (SDI-1) because it interfered with the synthesis of new DNA. The team will report its results in an upcoming EXPERIMENTAL CELL RESEARCH.

SDI-I turned out to be the same gene that Harper and his colleagues, located just one floor away, had uncovered while investigating genetic regulation of the cell cycle. That group had called the gene CIP1. Then a casual phone conversation between Baylor's Stephen J. Elledge and Bert Vogelstein of Johns Hopkins School of Medicine in Baltimore led to the realization that Vogelstein's team also had this gene in hand, under the alias of WAF1.

"We were the first two people to have a model of how p53 worked," Elledge recalls. "It was really quite a moment when we figured this out."

Vogelstein had known that the p53 protein exerts its tumor-suppressing effect indirectly, by regulating the activity of other genes. Using brain tumor cells grown in a laboratory dish, he and his colleagues determined that WAF1 turned on in the presence of normal p53 genes

but not in the presence of mutant p53, they report in the Nov. 19 CELL.

The addition of lots of WAF1 to brain, lung, and colon tumor cells lacking functional p53 stops the cells' uncontrolled growth, notes Hopkins' Watik S. El-Deiry. Also, their data show that human p53 activates rodent WAF1, demonstrating that these genes and their proteins have been conserved through evolution.

While the Hopkins group was figuring out how p53 works, Harper and Elledge were trying to understand the link between the cell cycle and cancer. They developed a screening test to determine what controlled the activity of a cyclin-dependent kinase enzyme. This enzyme and others like it link up with proteins called cyclins, and together these molecules push a cell to start dividing.

The researchers screened for CIP1 by adding different pieces of human DNA to genetically engineered yeast. Genes essential for the yeast's survival would turn on only when the added DNA caused the yeast to produce a protein that bound to cyclin-dependent kinase, also a protein. Other work had already implicated the CIP1 protein in cell division.

The discovery illustrates the power of this new screening technique, which enables scientists to elucidate protein-protein interactions, says Elledge.

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Next, Harper and Elledge determined that in a laboratory dish. CIP1 virtually shut down the chemical activity of the cyclin-dependent kinase. Further test showed that the CIP1 protein did not keep the kinase from attaching to cyclin but did make the pair ineffective in stimulating cell division, they report in the Nov. 1

Cells typically possess this built-in check on cell division. But when ps^ malfunctions, "the cell can no long make sufficient levels of the inhibitor stop the cell cycle," Harper suggests.

"I think this idea of negative regulato is going to be an important one." say Hunter. However, he and the Hopkim group caution that this gene and its protein, whatever its name, may not the critical target or may be just one several targets of p53 and other regulators of cell division.

Even so, these scientists say they home the discovery will lead to new anticance therapies.

-E. Pentali

## Dioxin linked to reproductive disorder

For the first time, researchers have connected the chemical TCDD, one of the most toxic members of the dioxin family, to endometriosis, a painful disease that affects an estimated 10 percent of women and can cause reproductive problems.

In a study of rhesus monkeys exposed to TCDD, Sherry E. Rier of the University of South Florida Coilege of Medicine in Tampa and her colleagues found that TCDD's effects on the body's hormonal and immune systems (SN: 1/11/92, p.24) may underlie the endometriosis-dioxin link, she says. "Chronic immunosuppression in combination with hormonal dysregulation may have facilitated the aberrant growth of endometrial tissue" in the monkeys, the team writes in the November Fundamental and Applied Toxicology

In endometriosis, endometrial cells grow outside their usual home in the uterus, forming nodules in such places as the fallopian tubes or ovaries.

The study is "strongly supportive" of a link between TCDD exposure and the disease, says Linda S. Birnbaum, director of environmental toxicology at the Environmental Protection Agency in Research Triangle Park, N.C.

Endometriosis had been found in rhesus monkeys exposed to polychlorinated biphenyls (PCBs) and to radiation. TCDD, however, had not been implicated

For four years beginning in 1978, Rier' group fed 14 monkeys a TCDD-laced diese as part of a study on the health effects of that chemical. Autopsies on three mor keys that died between 1990 and 199 uncovered endometriosis and promptes the researchers to examine the other animals.

The team found that five of the severanimals that had received a large dose of the chemical — 25 parts of TCDD per trillion parts of food (ppt) — develope a moderate to severe endometriosi. Three of the seven given 5 ppt of TCD had moderate to severe disease. Other monkeys, including two of six fed normal diet, developed a very mild for of the disease.

Stores of TCDD peaked at 100 to 800 parts per trillion in the body fat of to monkeys, says Robert E. Bowman, a tired behavioral toxicologist and member of the study team. However, people and animals vary considerably in homuch dioxin they store, he warns, about 100 ppt of TCDD, monkeys "are genting into dangerous territory" regarding the risk of endometriosis, he says. The body fat of most humans contains ab 7 ppt of TCDD, says Bowman. — T. American

NAME CYNDY MOREY ADDRESS 8015 CANYON FERRY #2 HELENA, MT HOME PHONE 475.3405 WORK PHONE Same REPRESENTING SELF-FAMILY APPEARING ON WHICH PROPOSAL? 58 # 199 DO YOU: SUPPORT V OPPOSE AMEND **COMMENTS:** I LIVE IN THE BIG BELT MTNJ, WITHMY HUSBAND, BILL & OUR TWO DAUGHTERS. THE CHILDREN ATTEND EAST HELENA AND HELENA HIGH-SCHOOLS. THIS IS MY SPECIAL INTEREST GROUP. SENATORS, IMAGINE IF YOU WILL THE REPONSE IN YOUR COMMUNITYS MISSOULA, GREAT FALLS, LIBBY, TOWNSOND, BILLINGS, LAUREY, ARUSE, BIG TIMBER IF YOU APPROVED THE ARRIVAL OF 30 MILLION POUNDS OF THE VILEST CHEMICAL COMPOUNDS IMAGINABLE, BURN THEM IN A 30. YE. OLD ACCIDENT PRONT INCINERATOR, NEXT TO YOUR CHILDS SCHOOL YARD, AND MAKE DOWNWINPERS OF EVERYONE IN YOUR HOMETOWN. TRY TO LOOK YOURSELF IN THE PRIRIER. I AM BEGGING YOU TO FOLLOW YOUR CONSCIENCE, BUT MOST OF ALL, TO DO YOUR TOB: TO PROTECT THE PEOPLE OF MONTANA.

CENATE NATURAL RESOURCES

## WITNESS STATEMENT

PLEASE LEAVE PREPARED STATEMENT WITH COMMITTEE SECRETARY

Testimony on \$B 199
Senate Natural Resources Committee
January 30, 1995

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The Montana Audubon Legislative Fund strongly supports £B 199 and urges your support for the bill.

The burning of hazardous waste should not be done in an area where it can adversely affect human health, agriculture, or water supplies. Specifically, the Ash Grove Cement Company's plan to burn commercial hazardous waste within one half mile of an elementary school is an unacceptable risk to place on the immediate area's residents. A three mile siting criteria can insure that such irresponsible and dangerous proposals will not take place in the future.

Our support for this bill and overall concern about hazardous waste incineration is based on the problems associated with burning waste in cement kilns. Here are just a few of the reasons why our members are concerned:

- \* cement kilns were not designed to dispose of hazardous waste
- \* incinerators burning commercial hazardous waste emit thousands of different chemicals, including heavy metals
- \* released dioxins have been linked to cancer and birth defects among other afflictions
- \* possible contamination of water supplies
- \* adverse effects to livestock
- \* there are already enough facilities to dispose of all of Montana's hazardous waste; most of the waste will come from out of state
- \* risk of accident in transporting waste
- \* decreased property values
- \* there is no past indication that the cement industry can safely dispose of commercial hazardous waste
  - ¶B 199's siting criteria can eliminate these needless risks. Thank You

Bill Allen

EXHIBIT NO. \$17

DATE /- 30-95

BILL NO. \$3-199

# January 30, 1995 TESTIMONY OF PAUL SMIETANKA - 110 Rockridge Drive, Clancy MT 59634 In Support of

Reasonable Setback Requirements for Hazardous Waste Incineration

513 199

I share a common belief with many other Montana citizens and local residents that hazardous waste should not be incinerated at the Ash Grove Cement West's facility at Montana City. However, regardless of my opinion this committee must act impartially and review this current legislative proposal on its merits. It is with studied demeanor that I ask you to exercise some simple impartial logic. Any impartial observer to the debate concerning incineration of hazardous waste must acknowledge some fundamental facts.

One fact is that regardless of any current state or federal standards regarding waste incineration, there is a wealth of scientific arguments justifying the safety of hazardous waste incineration in general. Conversely there is a substantial body of knowledge that refutes that incineration cannot be conducted safely. Given this vigorous debate, reasonable and impartial people can only conclude that this question of the *short term* safety of hazardous waste incineration is not resolved. And quite simply, the *long term* consequences of hazardous waste incineration are unknown.

The second fact reasonable people will acknowledge is that any action taken without reasonable appreciation of the consequences of that action, be it short or long term, is speculation. A better word is gambling.

The third fact reasonable people must acknowledge is that hazardous waste incineration has an inherent impact upon the health of the public. And, heretofore, the health of the public has been or should be under the exclusive providence of elected and accountable public officials.

A fourth fact is that regardless of the current status of the debate concerning hazardous waste incineration, if presented with a clean paper design, no engineer in his or her right mind would propose incineration immediately proximate to population centers or waterways. Universally, engineers seek the least intrusive location.

Finally, the fifth fact reasonable people and reasonable legislators must acknowledge is that under the law, corporations are artificial entities established primarily to limit the liability of their owners and principals.

So, what do these facts tell a reasonable person? They tell reasonable people that at the very least:

- 1. We don't know what the health consequences will be at Montana City at least in the short run and certainly not for the long run.
- 2. Any legislative action that inhibits implementation reasonable safety precautions such as the very conservative siting standard before you is essentially speculation on the lives and health of current any future Montanans.
- 3. Any failure of this legislature to acknowledge and implement the reasonable wished of potentially affected citizens is an abrogation of the legislature's legal obligation to provide for the health of all Montanans and each legislator's constitutional obligation to guarantee a clean Montana environment.

DATE 1-30-95

BILL NO SB-199-11

4. Failure to implement reasonable controls over any activity that has such potentially far reaching and possibly disastrous effects is a mortgage of the future of all Montanans.

Our history is replete with examples that while many of these alter egos exploit Montana's wealth, they are organized in a bramble bush of corporate entities. And when these same ventures ultimately face long term liability for their actions, those entities are dissolved.

This is the age that we have all come to appreciate the enormous obligation we have placed upon our future generations due to shortsighted deficit spending at the federal level. So Montana's legislature must also appreciate the earnest desire to assist the good people who work at Ash Grove, by condoning hazardous waste burning without any setbacks whatsoever, can none the less be the deficit spending of Montana's long term health for a short term economic fix.

The reasonable and accountable thing to do is represent all Montanans and support reasonable siting standards reflected in this legislation.

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Testimony before the Senate Natural Resources Committee Re: SB 199

Mr. Chairman and Members of the Committee:

My name is Anne Johnson. I live in Bozeman and am here representing Montanans Against Toxic Burning, a citizens' group with members across the state. I request that this testimony become part of the official hearing record.

You've heard from the hazardous waste industry that hazardous waste burning is safe. Their claims are apparently based on theory, because, according to Dr. Barry Johnson, Assistant Surgeon General and Assistant Administrator of the Agency for Toxic Substances and Disease Registry, "the relevant studies have not been done" with regard to the human health impacts of incineration. I will submit this documentation with my testimony.

You've also heard from scientists, health officials, agriculturalists and citizens who say that hazardous waste burning cannot in fact be done safely. Their concerns are based on what has happened in places where hazardous waste is burned. This includes anecdotal evidence of health effects to humans and livestock, documented damage to dairy products, and records of violations by Ash Grove and other burners of hazardous waste.

Who is to be believed? Both sides are telling the truth as they perceive it. But let's look at it from another standpoint. What does the hazardous waste industry stand to gain? Very simply-profit, and lots of it.

What do the citizens of Montana stand to gain by having hazardous waste imported from other states to be burned next to their schools, homes, farms? Nothing! But Montanans could LOSE: their health, the value of their homes and property, their livelihoods. And they could LOSE AGAIN as costs to the state of Montana increase for permitting, monitoring and enforcing the regulations regarding this questionable practice.

The only responsible thing to do is to act prudently and in the interest of public health and safety, as most other states have done, and at least require that these facilities be located a reasonable distance from residences, schools, daycares, hospitals, water supplies for both livestock and people, farm and grazing land, and parks.

# MontPIRG

DATE 1-30-95
BILL NO 5 B-199

Montana Public Interest Research Group 360 Corbin Hall - Missoula, MT - (406) 243-2908

Testimony For Senate Bill 199, January 30, 1995 Chairman Grosfield and members of the Senate Natural Resources Committee:

For the record, my name is J.V. Bennett, for the Montana Public Interest Research Group, or MontPIRG.

MontPIRG is a non-profit, non-partisan research and advocacy organization working for good government, consumer rights and sound environmental protection. MontPIRG represents over 4000 members in Montana, with 2200 student members students, and is funded with membership donations.

Despite our belief that SB 199 does not go far enough in protecting Montanans health and well-being from hazardous waste burning facilities, we urge you to pass SB 199 because it does provide an improvement over the current situation, which offer little real protection. In particular, we would like to see language added which would offer more protection for Montana's agricultural lands and surface waters.

MontPIRG is concerned about the practice of incinerating hazardous waste for primarily three reasons: it endangers public health, it endangers Montana's important agricultural industry, and there is simply no compelling need.

There is no creditable doubt that the emissions from hazardous waste facilities will harm the health of Montanans living in the surrounding areas. The EPA's recent study on dioxin confirms that the burning of hazardous waste, whether in cement kilns or commercial incinerators, is a major source of dioxins. The report also documented that dioxin is an even greater health threat than previously thought. Dioxin is harmful in extremely small amounts and accumulates in the body over time. Therefore any additional amount to which a population is exposed is dangerous. Dioxin is known to cause cancer, reproductive damage, disruption of the endocrine system and deficiencies in the immune system. In addition, the burning of hazardous waste will release toxic metals, such as lead, cadmium and arsenic, which cause sever health problems as well. Clearly if Montana allows the burning of hazardous waste it will put the health of our citizens at risk.

1-30-95

Moreover, the incineration of hazardous waste presents a threat to Montana's agricultural industry as well. In the EPA's dioxin report it was confirmed that the majority of people's exposure comes not from direct inhalation, but rather through the dairy and meat products they consume. Dioxins and other toxic substances become lodged in the fatty tissue of animals and are passed up the food chain to humans who eat them.

Currently Montana's agricultural industry enjoys the perception that Montana is a clean and healthy place, and the food raised here is safe and healthful. This will change if it is discovered that Montana is allowing the burning of hazardous waste near its agricultural lands. Even the perception of contamination could be very damaging to Montana's agricultural industry. For this reason the burning of hazardous waste places the most important segment of Montana's economy, agriculture, at risk.

Lastly, there is no need for hazardous waste burning facilities in Montana. Montana doesn't produce enough combustible hazardous waste to fuel even one of these facilities. A fact which means that any such facility would have to import large amounts of waste from out of state. Moreover, there is currently 32 million tons of overcapacity for managing hazardous waste in the Western region of the United States. Since Montana is part of a 17 state regional Capacity Assurance Program which assures Montana the ability to handle its hazardous waste for the next twenty years, there is no compelling need to permit any new facilities in Montana.

Moreover, the burning of hazardous waste in cement kilns undermines an effective incentive for generators to minimize the amounts of hazardous waste they produce. The liability hazardous waste carries is acting as an economic incentive to decrease the amount of waste being generated. Because of legal exemptions given to cement kilns liability, but not the toxic compounds, disappear when hazardous waste burned in cement kilns. For this reason the burning of hazardous waste, particularly in cement kilns, puts real solutions, like waste minimization, at risk.

Because of the threats posed to public health, Montana's agricultural industry, and real solution by burning hazardous waste, MontPIRG urges you to give SB 199 a do pass recommendation. We also urge you to consider adding language which would protect agricultural lands and surface water.

DATE / -30-95

BILL NO. S B-199

January 29, 1995

Kane & Anita Quenemoen 15 Arrowhead Lane Clancy, MT 59634

The Senate Natural Resources Committee Montana State Senate Capitol Station Helena, MT 59620

Dear Senate Natural Resource Committee Members:

We are writing to ask for your support of Senator Mike Foster's hazardous waste incineration siting bill (SB199).

Ash Grove Cement seeks to import largely from out-of-state, and process through its kiln and stack, over 30 million pounds of heavy metals and poisons. The Company would do so next to our elementary school, day care, and residence.

To date, the Company has not responded to 14 pages of recommendations made by its hand picked "Citizens Advisory Council". The recommendations are intended to minimize and identify, after the fact, symptoms of poisoning in school children, workers and citizens residing near the plant. They are also intended to safeguard local business and residential property values. To many of us, it appears the Company intends to avoid negative public reaction by continuing to delay its response to these recommendations until after this legislative session is over and you have all gone home. The recommendations enforce our beliefs regarding risks to public health and property values and are simply too costly for Ash Grove to implement.

We believe it is in Montana's best long term interest to encourage the State's workers and businesses to adopt state-of-the art technology and invest in modern competitive infrastructure. For the cement industry this would entail retooling to incorporate cement manufacturing techniques (commonly referred to as "dry processes") utilized by plants they currently operate in other states. They would not as Ash Grove is proposing for Montana, endanger our communities, businesses and agricultural interests by coupling ineffective waste disposal technology (incineration) with out-dated inefficient cement manufacturing technology (the "wet process"). Our State deserves better than becoming a repository for industrial poisons produced elsewhere.

Again, we urge you to support Senator Mike Foster's common sense approach to this issue. It incorporate's our belief that the best way to minimize risk is to avoid it where ever

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possible. Montana certainly has not reached the point where its citizens must risk their children, businesses, property values, and health in the interest of disposing of waste produced elsewhere and accommodating a company that has expressed little interest in maintaining the long-term viability and health of the community in which it is located.

Sincerely,

Kane and Anita Quenemoen

TO: Senate Natural Resources Committee re: 5B 199

EXHIBIT NO. 21

DATE 1-30-95

BILL NO. 50-199

Senator like Foster offered an ear to Montanais in his district regarding hazardons waste incineration. He find that the majority of those responding were deeply concerned about this issue. Senator Fosters bill is exatly what Montanains have asked for to ensure our public health.

Restrictions hazardows waste incineration within three.
nuites of residences, schools and public drinking water will
not only ensure the public's health, but it will also
assure home owners that property values will not be

We are looking to you, our efected officials, to protect our health. Please do not allow the burden of prot of this uncertain industry to fall on the backs of our children. Your approval of this bill will be recognized for generations to come.

Thank you.

Maggie Pittman 2 Twilight Dr. Clancy, MT 59634 January 30, 1995

Dan Pittman #2 Twilight Drive Clancy, MT 59634 EXHIBIT NO. 22

DATE 1-30-95

BILL NO. 58-199

Dear Mr. Chairman and Committee Members:

I am a self employed natural resource consultant living and working within the Montana City area. My clients are landowners and business people who want to empower themselves with information so that they can make a sound decision based on logic and facts. In the case of the residents who support SB199 they have done their homework. The facts are:

- 1. Residential property tax makes up 34% of Montana's tax base. It is the highest portion of Montana's tax base.
- 2. Researchers at Penn State and Northeastern University found that homes are devalued \$8,100 for every mile they get closer to hazardous waste incinerators.
- 3. Serious physical and adverse health effects occur to citizens located near hazardous waste incinerators. Heavy metals cannot be destroyed and dioxons and furons are created.
- 4. There is currently a surplus capacity of hazardous waste incinerators.
- 5. Economic benefits from burning hazardous waste will only increase the profit margins of Ash Grove at the cost of devaluing our homes and the health of our children.

The burning of hazardous waste is not compatible in a community setting, posing a threat to our health and livelihood. Don't make Montana City a dumping ground for those businesses and communities who want to get rid of their hazardous waste.

Please approve SB199. Your approval will, no doubt, be remembered and valued by residents and business people in this area and throughout the state for years to come. Thank you.

Sincerely,

Dan Pittman

SUNATE NATURAL RESOURCES EXHIBIT NO. 23 DATE 1-30-95 BILL NO. 58 -199 Serate Natural Resource Committee SB 199 Dear members of the I mile g produksig Ash Grove songs Let the 5/3 That you. Parel P Collis 2000 50 with Hills Nd

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Memb	urs of the Natural Resources	Committee:	
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r Selli	SIMATE HATURAL RESOURCES	J. Deck 10 Saddle Mtn Dr	
		J. Beck	

EXHIBIT NO. 25

DATE /-30-95

BILL NO. 513-19 9

My name is Mary Ann Wellbank. I live in Clancy Montana. I urge you to vote in support of SB 199. It is a reasonable means of ensuring the health and safety of our children.

Ash Grove's future is not the issue. Our children's future is the issue. The legacy we are leaving future citizens of Montana is important.

Ash Grove has stated that it will not remain an economically viable employer in Montana if it cannot burn hazardous waste in its cement kiln, which is located right next to a school, a residential community, a water source and agricultural lands. Which is more important - Ash Grove's future as an incinerator or our children's future?

If Montana wants to do something particularly for Ash Grove - let us look at other incentives to offer that company to help it evaluate and develop economic alternatives to hazardous waste incineration. I'd ask you not to vote against SB 199 just because of the alleged economic hardship it may cause Ash Grove. Voting "no" to SB 199 would be the same as supporting the single interest of one corporation to the detriment of the public health. Please vote for SB 199 because it is the responsible thing to do for Montana.

Mary Hun Wellbank Clang, Monzana

DATE 1-30 C
DATE 1-30-95 BILL NO S
Senate Natural Resources Committee,
June to Bill 199 In dealing
I support Senate Bill 199. In dealing with an activity like hazardous waste burning, I believe setting site gendelines in the responsible thing to do. It is in the best interest of all Montanans to carefully select sites for activities whose potential health impacts are unknown at this time
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If we must error lets error on the side of contron. We look to you for our safety. Support till 199.
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LIATE NATURAL RESOURCES

EXHIBIT NO. 27

DATE 1-30-95

BILL NO. 58-199

Senate Natural Resources Committee Montana State Capitol Building Helena, MT 59601

January 30, 1995

Dear Senate Natural Resources Committee Members:

I support SB199. Based on factual information, this bill must be passed and implemented to, most importantly, protect the health of our citizens; and Montana's number one industry, agriculture. I request that you too please promote a healthy future for Montana and support SB199.

Thank you for the time you put forth for this very significant bill.

Sincerely,

Jacquelin Daggy

Jacquelin Daggy

34 Big Dipper Drive

Clancy, MT 59634

Submitted to Senate Natural Resource Committee January 30, 1995 by Anne Johnson, Boyeman

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Testimony by

Barry L. Johnson, Ph.D.

Assistant Surgeon General

Assistant Administrator

Agency for Toxic Substances and Disease Registry
Public Health Service
U. S. Department of Health and Human Services

Before the

Subcommittee on Human Resources and Intergovernmental Relations Committee on Government Operations United States House of Representatives

January 24, 1994

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1-30-95

assessed. For some sites, temporarily-sited incineration may be the most protective of human health, when compared to other alternatives. However, regardless which type of disposal technology is selected, the public health impact of such a technology can only be accurately assessed if appropriate public health strategies are made an integral component of the implementation of any chosen technology, including incineration.

Although significant data gaps exist in our knowledge about the public health impact of incinerators, adherence to the following public health practice strategies can begin to help us obtain information about human exposure and adverse health effects.

- An accurate assessment of the public health implications of a waste disposal facility can only be meaningful if it is specific to that facility, the environment, and community surrounding the facility. Although modeling and other risk assessment methodologies provide useful predictive data, this information should be supplemented with actual data from the facility in question surrounding the environment and above all the health data from potentially affected communities.
- The selection of a specific location of an incineration or other waste disposal facility should be influenced by the demographics of the proposed location. The development of a comprehensive health-oriented demographic profile to include population density and socioeconomic indicators of a proposed siting location is therefore needed.
- A review from a public health perspective of design, operating, maintenance and monitoring data of a proposed incinerator is critical to ensure that the operation of such an incinerator is not likely to be harmful to the public.
- Health monitoring is as important as facility monitoring: i.e. the conduct of well designed health monitoring studies before, during and after operation of the facility should be an integral component of the overall project. Specifically, provisions should be in place to conduct rapid exposure assessments if upset conditions result in accidental releases of hazardous substances.
- Community participation in each aspect of the overall project is critical. Involving communities creates an overall awareness and an opportunity for productive information exchange among all parties involved.

Turning to the eight issues you raised in your letter of invitation, our responses are as follows:

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wastes. Reports from these three panels are in peer review, and ATSDR-will be pleased to make those available to the Subcommittee when they have been completed.

ATSDR has also investigated the effects on community health of an incinerator in North Carolina, the Caldwell Systems Incinerator. The incinerator disposed of industrial solvents and hazardous wastes in the 70's and 80's. This incinerator appears to have operated outside its operating capacity, resulting in incomplete combustion of hazardous wastes. ATSDR was requested by a local physician and EPA Region IV to evaluate the health problems of residents living in the vicinity of the incinerator. ATSDR's investigation found an increased pattern of respiratory problems in community residents. In addition, residents complained about irritation of the airways and poor motor coordination. A follow-up study is currently underway to better evaluate the health problems reported by the residents. This study focuses on determining the presence of adverse health effects of the pulmonary, neurobehavioral and immune systems.

In Arkansas, the community living near the Vertac Superfund site incinerator expressed concerns about the public health impact of the facility to the Arkansas Department of Health (ADH). To assist ADH, ATSDR awarded two grants to conduct an exposure study and a reproductive outcome study. Preliminary findings from the exposure study indicate the presence of an association between elevated body burdens to certain compounds (2,4-T and dioxin) and length of residence near the site. This constitutes historical, pre-incineration exposure. The incinerator is currently operating. The next round of exposure testing is scheduled to occur this Spring.

ATSDR is also supporting a "Health and Clean Air Study" conducted by the University of North Carolina. The study will further explore the occurrence of and risk factors for lung and respiratory diseases potentially caused by hazardous substances. The study compares residents of communities living near a municipal solid waste, a medical-waste, and a hazardous waste incinerator, with three nearby control populations over a period of three years. Components of the study include baseline spirometry, peak flow measurements, nasal lavage and a survey to collect information about respiratory symptoms and outcomes. Data collection for this study is ongoing.

# 2. What role does ATSDR have in determining the likely health impacts during environmental impact analysis for incineration permits?

ATSDR has no direct role that involves impact analysis for incinerator permits. We have, however, provided consultative services to EPA and some state health departments on issues relating to incineration of wastes from some individual Superfund sites. To date, our consultations have come after remedial recommendations were derived to temporarily site an incinerator at a Superfund site. We have advised on questions like proximity of the proposed incinerator to

EMATE NATURAL RECOURGES

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occupational investigations, and some community health studies. Lead is known to exert toxic effects on the nervous system, kidney, immune function, and reproduction. It is associated with hypertension in middle-aged persons. Mercury or mercury compounds are known to be toxic to the nervous system, kidney, and immune function. Concerning PCBs, data from epidemiological studies and the scientific literature indicate that human exposure to these compounds may result in cancers of the hepato-biliary tract, as well as reproductive/developmental, dermatological, cardiovascular, hepatic and endocrine/thyroid effects. Dioxins have been extensively studied in toxicological studies. The most toxic member of the family of compounds called dioxins is 2,3,7,8-TCDD. Human health effects stem primarily from occupational studies of workers. TCDD has been associated with chloracne, metabolism alterations, soft tissue sarcoma, and altered reproductive hormone levels. EPA lists TCDD as a probable human carcinogen. EPA is currently completing a reassessment of the human health risk of dioxin. Furans have been associated with dermal, ocular, neurological effects in humans.

It is important to emphasize that almost all of our toxicologic data are based on studies where exposure levels greatly exceed those typical of incinerator releases.

Adequate information does not exist to support speculation on what, if any, human health effects might be associated with incinerator emissions. However, our experience with public health associations related to hazardous waste sites would suggest the need to conduct two kinds of human health investigations. One kind of investigation would look at cancer, birth defect, and respiratory disease rates in areas thought to be impacted by releases from incinerators. These studies would combine health data from many geographic areas. A second kind of study would be site specific. Community health surveys would help clarify whether any unusual exposure or morbidity is occurring that might be associated with a given incinerator.

4. What data do you have or gather on additive, multiple, and synergistic impacts when there is exposure to more than one chemical, as would be the case with incinerator emissions? Do you expect those impacts would be greater than from single chemical exposure alone?

There are few data available in the scientific literature on specific interactions of the contaminants that may be released from waste incinerators (dioxin, furans, lead, mercury). In the absence of specific studies using combined contaminants, and limited understanding of the mechanisms of actions for some substances, it is prudent to assume that the effects of exposure to these contaminants is additive.

5. What data exists on the sensitivity of various populations, by age, gender or ethnic background, to these chemicals?

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Moreover, elderly persons and those with chronic illnesses are often socially isolated and potentially less aware of environmental emergencies. Because of special physical challenges, they may also require special services during time of evacuation in the event of such an emergency.

Minorities. Preventing adverse health effects in minorities exposed to hazardous substances is a priority for the Agency for Toxic Substances and Disease Registry (ATSDR). Minority populations, particularly African Americans, Hispanics, and Native Americans suffer disproportionately from preventable morbidity and mortality. Regardless of income, education, or geographical locale these populations are often in poorer health than their white counterparts. This disparity is often associated with inadequate access to health care for preventive services as well as early diagnosis and treatment of disorders including those that may be associated with exposure to hazardous substances. Their disadvantaged economic status also frequently affects priorities on nutritional status. Occupational chemical exposures may increase this population's susceptibility to adverse health effects resulting from other exposures to hazardous substances. In addition, certain pre-existing genetic disorders (G6-PD deficiency, sickle cell anemia) may compound the impact of such exposures.

6. The area proposed for the incinerator in the Brooklyn Navy Yard has a dense residential population. It also has schools, churches, synagogues, and mosques within one mile of the site. How does that affect the likely impacts from incineration?

When a dense residential population is in close proximity to industrial facilities such as incinerators, the number of people who may be potentially exposed to emissions from the facility is increased.

To determine the public health implications of the presence of an incinerator on residential areas requires a review of: the proposed design and operating conditions of the facility (including the handling of residuals); summaries of the historical meteorological conditions in the area; the topographic features and land use in the vicinity of the facility; and an evaluation of potential pathways for human exposure.

As stated earlier, in reply to Question 5, there are populations that may be more sensitive to chemical exposure. Therefore, as a public health agency, ATSDR generally recommends tighter controls on incinerators (and other industrial processes) to ensure lower emissions in communities where a facility is sited in close proximity to schools, playgrounds, day care facilities, and health care institutions. Close proximity to an emission source may lead to exposures that are increased in frequency, duration and intensity. Whether that exposure could result in adverse health impacts would have to be evaluated on a site or facility-specific, chemical-specific basis. However, as a general rule, when an incinerator is sited in a densely

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1. The incineration technology used or proposed to be used at a site should be proven to be appropriate for, and compatible with, the materials to be burned.

- 2. Proximity to residential and other populations and local meteorologic conditions should be considered to ensure a location that minimizes prevailing wind transport of air emissions to affected populations.
- 3. Trial burns, with appropriate stack sampling and analysis, and subsequent continuous emissions monitoring should be conducted to demonstrate that the incinerator performs as specified.
- 4. Adequate training should be provided to incinerator operators to ensure that the incinerator is operated in a manner that does not adversely affect the operators' or the community's health.
- 5. An active inspection program should be instituted.
- 6. Where the incinerator should be at a site close to neighboring populations, local ambient air monitors should be used to detect possible site releases to the air requiring corrective or emergency action.
- 7. Proper management of residual ash should be part of the design and operation of the incinerator.
- 8. Proper storage and transportation methods for pre-incineration wastes and post-incineration residuals should be in place.
- 9. Procedures consistent with the community right-to-know philosophy should be instituted to facilitate community involvement.

The second category of data gaps concerns the area of environmental health. Key data needs in this area include:

- o limited demographic and health data on the surrounding community.
- o lack of environmental data such as the types and concentrations of contaminants present and the environmental media contaminated.
- o limited number of exposure, health monitoring and surveillance activities in communities living near operating incinerator facilities.
- o data gaps in our knowledge about adverse health effects from specific hazardous substances.

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Lead exerts toxic effects on the nervous system, kidney, immune function, and reproduction. It is associated with hypertension in middle-aged persons.

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Mercury or mercury compounds are toxic to the nervous system, kidney, and immune function.

Dioxins have been extensively studied in toxicological studies. The most toxic member of the family of compounds called dioxin is 2,3,7,8-TCDD. TCDD has been associated with chloracne, metabolism alterations, soft tissue sarcoma, and altered reproductive hormone levels. EPA lists TCDD as a probable carcinogen.

Furans have been associated with dermal, occular, and neurologic effects in humans.

Excerpts from testimony before the United States House of Representatives by Barry Johnson, Ph.D., Assistant Surgeon General, Assistant Administrator, Agency for Toxic Substances and Disease Registry. January 24, 1994 and August 8, 1994.

EMMITE NATURAL RESOURCE

Barry Johnson, Ph.D., Assistant Surgeon General, Assistant Administrator,
Agency for Toxic Substances and Disease Registry.

Excerpts from testimony before the United States House of Representatives.

January 24, 1994 and August 8, 1994.

"Infants and children are arguably the most sensitive segment of the human population to toxic exposure. Infants and children are at special risk because

• they play outdoors,

• they ingest or mouth foreign objects,

• they are smaller (greater chemical doses per pound) than adults, they breath more air (greater volume and breathing rate per pound) than adults,

• they are nutritionally challenged (because of protein-calorie

requirements to support rapid physical growth), and

• they are undergoing developmental changes that make them especially vulnerable to chemical exposures.

Moreover, they have the longest life expectancies, during which longterm adverse health effects may become manifest. Certain disorders may not become evident until a child reaches a particular developmental stage, which may occur long after the damage was done." EXHIBIT NO. 29

DATE 1-30-95

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# MT Hazardous Waste Generation (source: MDHES)

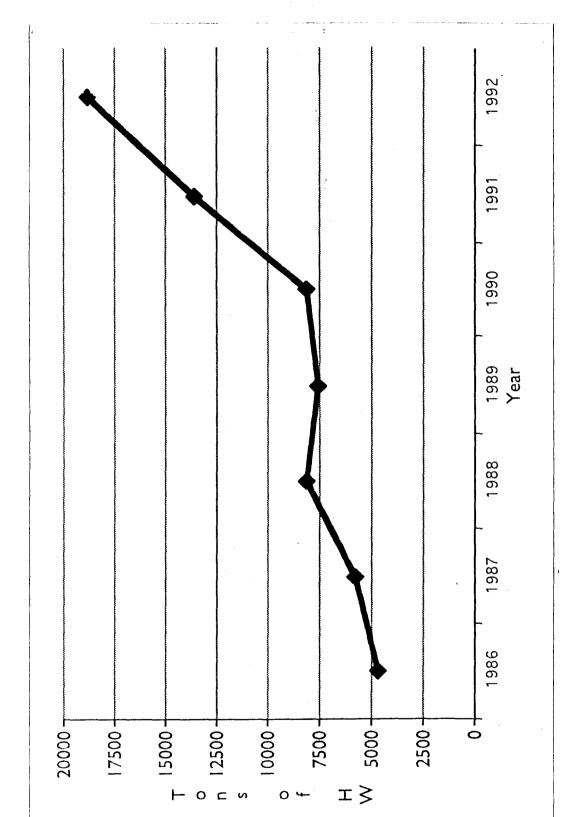
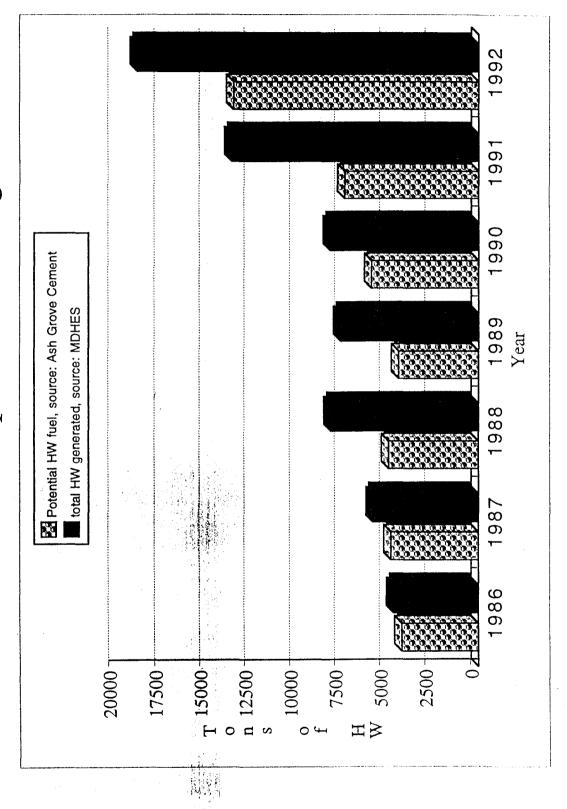


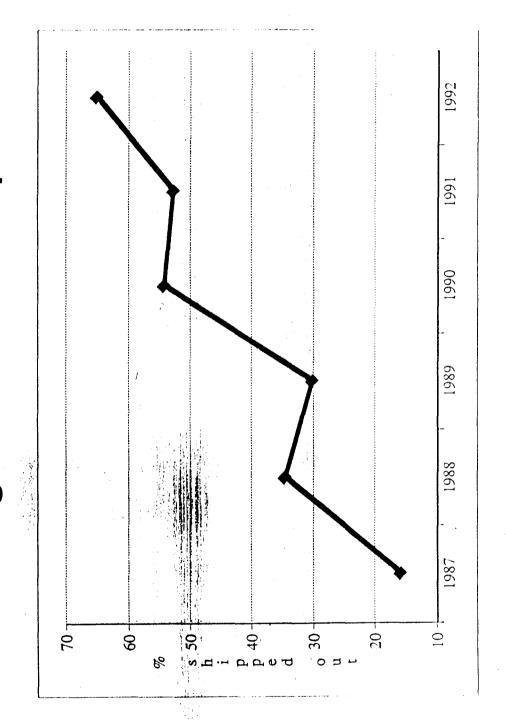
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Potential HW fuel as a part of total HW generation

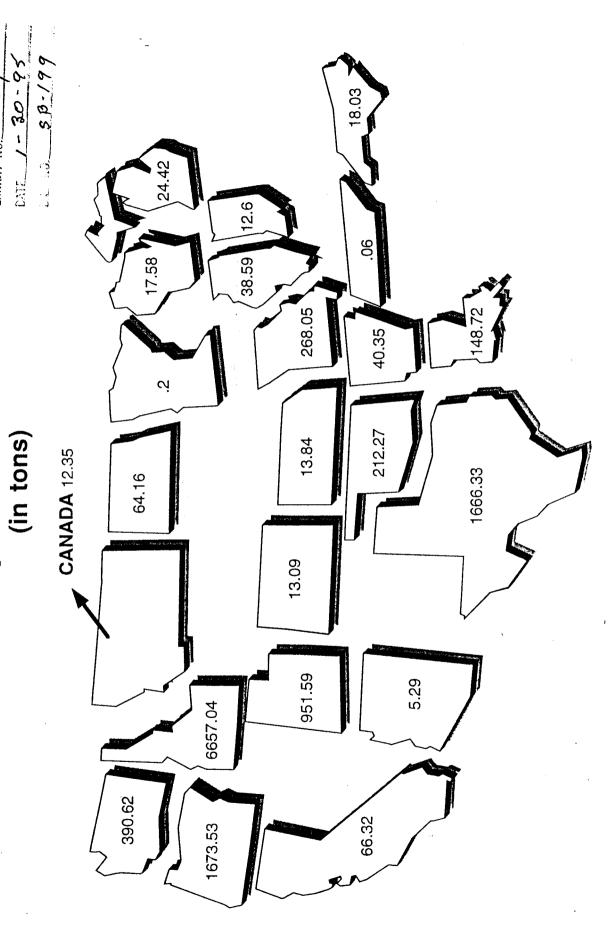


# Increasing Out-of-State Shipments



Source: MDHES

# SCHATE BLITURAL RESOURCES Where it all went - Montana's HW out of state EXHIBIT NO. shipments, 1992



source: MDHES, 1992 data

# H. GREGOR RIGO, PhD, PE, QEP PRESIDENT RIGO & RIGO ASSOCIATES, INC.

Dr. Rigo has more than 23 years experience as a mechanical and environmental engineer, researcher and waste management practitioner. His work includes developing and implementing efficient test programs, acquiring and reducing valid, representative data (often using advanced statistical techniques) and presenting the results. Dr. Rigo routinely uses engineering and scientific procedures to better our understanding of waste management systems and equipment. He is particularly interested in how these systems respond to changes in the waste stream. He uses this knowledge in assessing environmental and multipathway health risks, permitting and improving operations.

# **WORK EXPERIENCE**

# Dr. Rigo's experience includes:

- Technical and feasibility evaluation of integrated solid waste management system alternatives and emerging technologies, including market identification and marrying product characteristics to market requirements; method development to match seasonal waste generation rates and facility design characteristics; developing technically optimal plant sizes and configurations for integrated waste management systems; designing cost effective, waste quantity and composition characterization studies; monitoring design, construction and start-up of materials recovery and waste-to-energy facilities; and certifying performance test results for release of bond proceeds.
- Being Engineer of Record for the City of Long Beach's 1380 tons per day Southeast Resource Recovery Facility [SERRF] including preparation of all environmental permit applications and bid documents, witnessing performance demonstration testing and preparing the multipathwayHealth Risk Assessment.
- Providing expert opinions and testimony on environmental effects of waste-to-energy facilities, particularly emissions, emissions control equipment and environmental impact and multipathway health risk assessments.
- Directing and performing contract research and development projects:
  - determining types and amounts of recyclable materials available from municipal, industrial, commercial and institutional sources and formulating integrated systems to manage recyclable and non-recycled waste streams.
  - measuring and characterizing criteria and trace toxic air pollution emissions;
  - assessing the state-of-the-art in resources recovery and co-authoring the USEPA's 1976 Technologies Volume of the Guide Series for Municipal Officials;
  - determining the technical and environmental aspects of using densified refuse derived fuel as a stoker coal substitute; and
  - developing an integrated technical, economic and financial evaluation computer model for small-scale resource recovery plants, materials separation and recycling, and other disposal options at Navy shore installations and extending this model to large scale commercial and municipal installations.

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Conducting engineering studies on the recovery of materials from mixed waste streams and the use of solid waste as fuel; developing design and analysis procedures to replace rules-of-thumb; acquiring and interpreting field test data, including outlier identification and resolution, to create useful engineering parameters for performance prediction and environmental impact assessment.

H. GREGOR RIGO, PhD, PE, QEP (cont'd)

- Engineering and analyzing the use of liquid industrial waste as a cement kiln and industrial boiler fuel.
- Developing methods to abate nitric oxide emissions at nitric acid plants.
- Managing unique solid waste disposal problems at Army industrial facilities including infectious waste, overage munitions, biomedical waste and demilitarization of chemical warfare agents; researching safe landfill disposal and/or thermochemical destruction of overage pesticides and explosives.
- Extending and applying statistical quality control techniques to waste management problems including establishing achievable emissions limits and operating windows; statistically analyzing test data to calibrate coefficients used in engineering design procedures to improve plant designs; application of statistical quality control to routine performance monitoring at waste-to-energy facilities to maximize throughput and revenue by anticipating and quickening the detection of substandard performance.
- Estimating the life cycle cost of air pollution control systems and cost:benefit ratio for integrated waste management systems; preparing an incinerator engineering manual, a fuels manual, and a fossil fuels state-of-the-art review for the Department of the Army.
- Teaching graduate level air pollution control and monitoring courses; developing the OEPA certification courses for municipal waste incinerator operators; and teaching R4 (Recovery and Reuse of Refuse Resources); and other solid waste management training courses.

# **EDUCATION**

PhD University of Illinois, 1973 MS University of Illinois, 1971 BSME Ohio University, 1970

# PROFESSIONAL ENGINEERING REGISTRATIONS

California

Illinois (Examination)

Connecticut

Ohio

Delaware

# **PATENT**

Flow Separator and Heat Exchanger U.S. Patent Number 3,815,336 (June 11, 1974)



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H. GREGOR RIGO, PhD, PE, QEP (cont'd)

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- 41. Stukel, J. J. and Rigo, H. G., "Energy Effectiveness of Air Pollution Control Devices," Atmospheric Environment, Vol. 9, pp. 529-535, 1975.
- 42. Rigo, H. G., "Predicting Emissions From the Use of Refuse-Derived Fuel," Midwest Section of the Air Pollution Control Association, September 1975.
- 43. Rigo, H. G. and Stukel, J. J., "The Dichotomy of Gaseous Pollutant Control: Energy Efficiency Versus Environmental Protection," Energy and Environment Quality, May 1974.
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- 45. Rigo, H. G., Mikucki, J. J. and Davis, M. L., "Control of Nitric Oxide Emissions from Nitric Acid Plants," Pollution--Scientific and Engineering Solutions, Penton Press, 1973.
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- 27. Rigo, H. G., Licata, A. J., and Davis, B., "Integrated Air Pollution Control System for Resource Recovery Facilities," IGCI Forum 1987, Washington, DC, September 1987.
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- 12. Rigo, H. G., Chandler, A. J., and Sawell, S. E., "Debunking Some Myths About Metals," Proceedings of the 1993 International Conference on Municipal Waste Combustion, Williamsburg, VA, March 30-April 2, 1993.
- 13. Chandler, A. J. and Rigo, H. G., "Trace Metals & Municipal Solid Waste--The Environmental Management Challenge," 14th Canadian Waste Management Conference, October 1992.
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- 15. Chandler, A. J., Rigo, H. G., and Sawell, S. E., "Controlling Cadmium in Municipal Solid Waste Incinerators," 7th International Cadmium Conference sponsored by ILZRO, New Orleans, LA, April 6-8, 1992.
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- 21. McDonald, B. L., McDannel, M. D., Hahn, J. L., Rigo, H. G., and Wheless, E., "Performance of NO<sub>x</sub> Control Technologies on Three California Waste-to-Energy Facilities," Proceedings of the 1990 ASME National Waste Processing Conference, Long Beach, CA, pp. 75-85, June 3-6, 1990.
- 22. Rigo, H. G., "Evaluation of Incinerator Ash Testing Data -- A Statistically Correct Approach," Proceedings of the International Conference on Municipal Waste Combustion, sponsored by the USEPA and Environment Canada, Hollywood, FL, pp. 5C-15 5C-30, April 1989.
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DATE 1-30-95

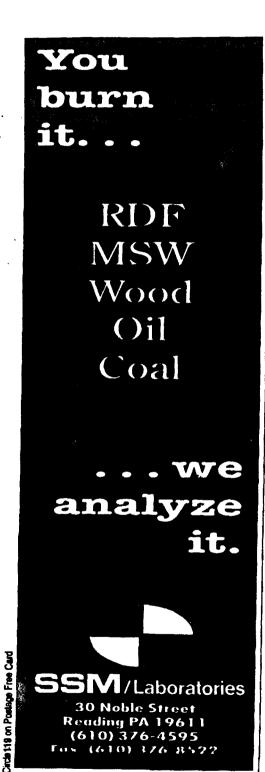
BILL NO. SB-199

# **MEMBERSHIPS**

American Statistical Association
ASME (and the Solid Waste Processing Division)
Air and Waste Management Association
Solid Waste Association of North America
Tau Beta Pi
Sigma Xi (Research Honorary)
Delta Sigma Rho & Tau Kappa Alpha (Forensics Honoraries)
Omicron Delta Kappa (Leadership Honorary)
Ohio University, Department of Mechanical Engineering, Board of Visitors

# **PUBLICATIONS AND PRESENTATIONS**

- 1. Rigo, H. G. "Sources of Dioxin in the Environment," Solid Waste Technologies, January/February 1995.
- 2. Rigo, H. G., Chandler, A. J. and Lanier, W. S., <u>The Relationship Between Chlorine in Waste Streams and Dioxin Emissions from Combustors</u>, ASME, Peer Review Draft, January 6, 1995.
- 3. Rigo, H. G., "Effect of Metals in Waste Components on Incinerator Emissions," presented at the Air & Waste Management Association's 87th Annual Meeting & Exhibition, Cincinnati, OH, June 19-24, 1994.
- 4. Rigo, H. G., Ferraro, F. A. and Wilson, M. "Effect of Nitrogen in Waste Components on Incinerator Emissions," presented at the Air & Waste Management Association's 87th Annual Meeting & Exhibition, Cincinnati, OH, June 19-24, 1994.
- 5. Chandler, A. J., Rigo, H. G., Sawell, S. E., "Effect of Lead Acid Battery and Cadmium Spiking on Incinerator Emissions," presented at the Air & Waste Management Association's 87th Annual Meeting & Exhibition, Cincinnati, OH, June 19-24, 1994.
- 6. Rigo, H. G., Ferraro, F. A. and Wilson, M. "The Relationship Between High Nitrogen Municipal Solid Waste Components and NO<sub>x</sub>," presented at the 1994 ASME National Waste Processing Conference, Boston, MA, June 6-8, 1994.
- 7. Rigo, H. G., and Chandler, A. J., "Metals in MSW -- Where Are They And Where Do They Go In An Incinerator," presented at the 1994 ASME National Waste Processing Conference, Boston, MA, June 6-8, 1994.
- 8. Rigo, H. G., and Chandler, A. J., "Managing Metals in MSW: Based on Sound Science or Myth?"; Solid Waste Technologies, p. 25, May/June 1994.
- 9. Rigo, H. G., "How Good are Today's Mercury Test Methods and Controls?," Proceedings of the Ash 6 Management & Utilization Conference, Arlington, VA, November 16-17, 1993.
- 10. Rigo, H. G., "Selecting Statistically Meaningful Emission Rates," Air & Waste Management Association's 86th Annual Meeting & Exhibition, Denver, CO, June 13-18, 1993.



38 SOLIO WASTE TECHNOLOGIES Jonuary/February 1995

# Dozens of Dioxins with Varying Toxicity

District strates single chemical compound. The term "dioxin"—as used in environmental shealth assessments—really represents 210 different compounds [75 different chlorinated dibenzofurans]. Each of these compounds has a different society ranging from zero to much greater levels. Because of this, scientists and risk communicators have begun to discuss dioxin emissions in terms of "toxic equivalents" rather than total dioxin emissions. This way, the issue is not clouded by inflated numbers that include environmentally insignificant compounds.

Several schemes for determining toxic equivalents have been proposed. In 1989, international scientific consensus was reached on a set of International Toxic Equivalents that have been adopted by the U.S. Environmental Protection Agency<sup>22</sup> and most European countries. Dioxins expressed in this way are frequently noted as ITEQ.

To develop the "toxic equivalency" of a particular mix of dioxin compounds, the concentration of each compound in the mixture is weighted by its toxicity relative to an equivalent amount of 2,3,7,8 tetra chlorodibenzo-p-dioxin (TCDD). This particular compound, 2,3,7,8 TCDD, was chosen as the basis because it is well studied.

For a source with a known distribution of dioxins and furans, having either the total or ITEQ provides knowledge of the other. For example, the ITEQ of a cement kiln is around 1 percent of the total. That is, 1 percent of the actual total dioxin emissions are equal to an amount of 2,3,7,8 TCDD that theoretically would produce the same carcinogenic effect. Other types of combustion source display different relationships between ITEQ and total concentrations. For example, the ITEQ of the Columbus (Ohio) Waste-to-Energy plant is about 1.9 percent. It is apparent that comparing total dioxins between these two sources would be misleading because a cement kiln has to emit about twice as much total dioxin as an incinerator (everything else being equal) to produce the same environmental effect.

nificantly reduce (but do not eliminate) dioxin emissions. The lower end of the range probably represents the future.

—Hazardous waste incineration and utilization may or may not produce easily measurable levels of dioxins under trial burn conditions designed to maximize the emission of dioxins. The feed characteristics and type of air pollution control equipment employed are important. Dioxin concentrations typically range from 0.006 to 35 ng ITEQ per dry standard cubic meter (ng ITEQ/dscm) at 7 percent oxygen with median emissions being less than 0.2 ng ITEQ/dscm.<sup>12</sup>

—Cement kilns produce dioxins. Emissions of 0.47 and 7.6 ng ITEQ/dscm (at 7 percent oxygen) were measured while burning coal and hazardous waste respectively under trial burn conditions, where pollutant emissions are intentionally maximized. <sup>12, 26</sup> Some kilns are operated with high temperature air pollution control devices, conductive to the formation of dioxins. A recent review of cement kiln emissions indicates that current emissions are much lower than previously thought.<sup>20</sup>

## Conclusion

There is little doubt that releases of pollutants like dioxin should be limited. However, in the long run, no benefit will result from exaggerating dioxin's impor-

tance among toxic substances. Nor will benefits accrue if the contributions of some sources are overemphasized for political purposes rather than serious scientific findings. Elevating either the importance of a specific dioxin source or dioxin emissions in general can lead to unnecessary expenditures of limited resources and having fewer resources available to address other issues effecting human health or the environment.

If further scientific inquiry indicates that tighter control of dioxin is necessary, then control efforts need to address all sources with equanimity. Municipal waste combustors are a source of dioxin emissions. As such, they deserve reasonable scrutiny and prudent efforts to minimize emissions. However, MWCs already are among the few controlled sources of dioxin and the total dioxin emitted from these facilities is diminishing.

There are numerous other important dioxin sources, including some that need better quantification. There are also many unidentified sources of dioxin. These sources have yet to be controlled for dioxin releases to the extent that MWCs have been. If further control of dioxin is required, these sources are a likely place to begin. However, the public health and environmental benefits of any new regulations to reduce dioxin emissions from any sources need to be carefully weighed

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against the costs to do so. For now, it appears possible that there would be greater benefits by using the same money to address other, more pressing, public health issues.

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**AIR EMISSIONS** 

# **Sources of Dioxin in the Environment**

EPA released a draft reassessment of the health and environmental effects of dioxin last September. However, there were large gaps in EPA's report about the "known" and possible sources of dioxin in the environment. This article helps fill in the gaps.

By H. Gregor Rigo

ioxin is considered a probable human carcinogen at certain exposure levels and a potential cause of other non-cancer health effects. However, scientific work is neither complete nor firm about these effects. Before hurdensome

entific work is neither complete nor firm about these effects. Before burdensome, ineffective regulatory actions are taken, further scientific work needs to be completed on several fronts. One distinct area of need is a clearer determination and identification of the sources of dioxin.

Several organizations and researchers have attempted to perform national or global dioxin balances. An estimate by the U.S. Environmental Protection Agency (EPA) in a working draft of the dioxin reassessment document is that annual dioxin deposition in the U.S. is between 20,000 and 50,000 grams of International Toxic Equivalents (ITEQ) per year.' (See accompanying box for information about dioxin compounds and their toxic equivalency). The EPA also estimates annual emission of dioxin is 14,000 grams ITEQ per year. Total annual deposition is higher than annual emissions due to the movement of dioxin generated and deposited in previous periods. Other estimates of dioxin emissions in the U.S. range from 1,200

Greg Rigo, PhD. P.E., is president of Rigo & Rigo Associates, Inc., a firm specializing in air emissions monitoring, analysis, and control. Dr. Rigo can be contacted at Rigo & Rigo Associates. Inc., 1 Berca Commons, Suite 211, Berca, OH 44017; (216) 243-5544.

## ☑ Poor Reviewed

This article has been evaluated and adited in accordance with teviews conducted by two or more professionals who have relevant expertise. These peer reviewers judge monuscripts for technical accuracy, usefulness, and overall importance within the field of solid waste management.

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to 9,900 grams/year.2

To have a consistent basis for comparison, we assumed that wet and dry, particulate and gaseous deposition in the continental U.S. is 9.2 nanograms (ng) per square meter per year for urban areas (2 percent of total area) and 4.4 ng per square meter/year for rural areas (98 percent of total area). This leads to an annual average deposition estimate of 33,000 g/year-near the mid-point of EPA's estimate.1 As yet unpublished data indicates that urban deposition rates may be closer to 63 ng/m2 per year and rural deposition 5.3 ng/m per year. If these data are correct, annual deposition is closer to 44,000 g/year-the upper end of EPA's range.

A comparison of total annual deposition to the current knowledge of man's production of dioxin shows a serious imbalance. Deposition of dioxin is 2 to 10 times more than scientists can account for from man's activities. Perhaps the problem stems from focus. When concern about dioxin first emerged in the late 1960s, scientists wrote that current knowledge suggested that halogenated organic compounds, like dioxins, are very infrequently found in living organisms with the consequent conclusion drawn that dioxins are all man-made.' What was thought to be an undeniable fact 25 years ago is nothing but a myth today." Scientists now know that dioxins are natural products, environmentally common and produced by many natural pathways in living organisms; field, brush and forest fires: enzymatic conversion, etc. In short, contrary to long held belief, dioxins are not solely produced by man.

## Where Does Diexin Come From?

Figure 1 summarizes the dioxin contribution of the various sources discussed in the following. This should be taken as a

partial list, since much more can be done with the available data, and because new sources are constantly being identified.

-Municipal waste combustors (MWCs) today contribute about 1,030 game ITEQ/year, or 3.1 percent of the total 33,000 g/year of dioxins emitted ansorably in the U.S. This contribution is estimated using average measured emissions for each type of waste combustion facility, then calculating a weighted average emission factor. It is important to use weighted averages based on types of facilities. because dioxin is emitted at much higher rates from certain facilities. For instance, older facilities that have only hot-side electrostatic precipitators as pollution control components contribute a highly disproportionate share of the total dioxins emitted by municipal waste combustors. Newer waste-to-energy (WTE) plants with more sophisticated combustion controls and "best available" air pollution control technology emit very low amounts of dioxin.

EPA estimated that once the Envission Guidelines for waste combustors proposed in September 1994 are implemented. total dioxin emissions will be reduced by 98 percent.' EPA's estimate is based upon the agency's 1989 MWC inventory-and ignores the reductions from implementation of Emissions Guideline's issued in 1991. The 1991 rules, combined with plant closings induced by the Supreme Court's flow control ruling (such as Columbus, Ohio), will reduce total dioxin flux from MWCs to about 230 g/year-before the 1994 guidelines are finalized. This means MWCs contribute about 0.7 percent of the total annual emissions. When the 1994 guidelines are finalized, the contribution from MWCs will be reduced further-by about 75 percent-to about 60

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g/year, less than 0.2 percent of the national annual deposition. This compares favorably to Travis & Blaylock's estimate that municipal waste combustors contribute less than I percent of today's daily dioxin intake using the geometric mean of the emissions data they reviewed." Our estimate uses arithmetic averages because that represents annual emissions rather than a best estimate for a single plant.7

-Chlorinated chemical production historically resulted in the generation of dioxins as unintended trace contaminants. Dioxin levels range from about I part per hillion (ppb) up to 3 parts per million (ppm) depending on the chemical and process involved. Significant changes have been and are being made in the production of these chemicals. Many of the dioxin contaminated chemicals now contribute only 3 percent of their previous amounts.2

—Liquid soap has been identified as a source of dioxin in sewage sludge. Interestingly, enzymatic reactions and ultraviolet light convert some of the chemicals in sludge into dioxins as well. The soil removed during washing is another contributor. Sewage sludge contains between 50-60 ng ITEQ per kilogram (kg) of dry solids.

—Sintering plants that produce iron pellets from ore emit between 0.75 and 3 ng ITEQ per normal cubic meter of offgas. In Europe, they account for about 1,000 g ITEQ/year.<sup>2</sup> Comparing European and U.S. sintering capacity, this source could account for 1,700 g/year in the U.S.

—Steel foundries, especially those using scrap iron in electric arc furnaces, have measured dioxin emissions of 0.7-09 ng iTEQ/normal cubic meter.\* Higher levels have been measured for aluminum and copper recycling furnaces.

—Fossil fuel-fired power station emissions range from >0.01 to 0.1 ng 1TEQ per normal cubic meter. While the concentration is low, the volumes of gas

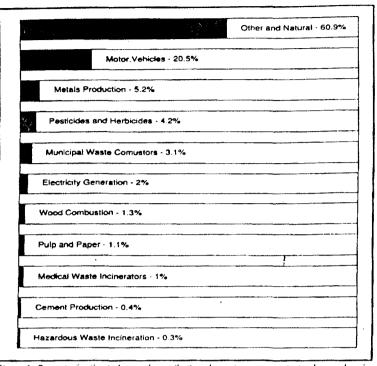


Figure 1. Percent of estimated annual contributions by various sources to total annual emissions of dioxin in the U.S. The estimate for motor vehicles is based on fuel vehicle hurned; other estiates based on emissions per mile driven lowers this contribution to 3.5 percent, but raises the contribution of "Other" sources to 77.9 percent.

involved make this a potentially major source. Recent testing of hazardous waste incinerators burning only commercial light oil (e.g., no hazardous waste) demonstrate the potential for dioxin emissions from oil fired power stations as well as coal fired units.<sup>12</sup>

—Fuel burning processes, such as wood burning fireplaces, stoves and power plants produce a range of emissions between 0.005 and 4 ng ITEQ per normal cubic meter. Power plants with state-of-the-art air pollution controls are near the low end of the range; fireplaces and wood stoves at the upper end. Charcoal grills emit 0.028 ng ITEQ/Normal cubic meter.<sup>13</sup>

Residential heating systems also can be significant sources of dioxin. Gas fired heaters emit between 0.0001 and 0.003 ng/dry standard cubic meter (dscm); oil fired units between 0.00039 and 0.00041 ng/dscm; wood stoves between 0.008 and 0.016 ng/dscm; fire places between 0.0006 and 0.3 ng/dscm when burning wood and between 0.1 and 2.8 ng/dscm when trash is thrown in. These emissions should be of particular concern, since they

are near ground level.

-Crematories emit up to 8 ng ITEO/ Normal cubic meter.' Hospital waste incinerators also emit dioxins. Data from four batch-fed. eight semi-continuous, and eight continuous units (ranging from small, uncontrolled to large units with sophisticated air pollution control systems) emit about 325 g/year of dioxins. Since measured hourly emission rates span almost 4.5 orders of magnitude, retiring or upgrading even a small fraction of these units can reduce the dioxin contribution to less than 100 g/year.

—Landfill gases used to generate power exhibit low dioxin emissions in the range of .0.1 ng ITEQ/Normal cubic meter.<sup>15</sup>

—Motor vehicles, especially cars burning leaded fuel (no longer sold in the U.S.), and heavy duty diesel trucks emit up to 8.4 ng ITEQ/mile and averaged 5.4 ng ITEQ/mile." Since these are ground level emissions, dioxin levels near long

upgrades may be particularly elevated by this source.

-Compost contains dioxins, Mixed waste compost contains 16 to 60 ng tTEO/kg-dry solids. Wet waste and green yard waste compost display 3 to 19 ng ITEQ/kg-dry solids." Recent research points out that dioxins may be formed in the composting process." This reinforces that some level of dioxin contribution is made by natural decomposition of organic matter in lawns, fields and forests. This is consistent with research conducted since the mid-1980s showing dioxins and other chlorinated organics are produced by a wide range of terrestrial and ocean drganisms and plants.4 While it is possible that the observed two- to tenfold increase in dioxins during composting is due to atmospheric absorption, consistently finding an increase, with or without aeration of compost, indicates that formation may be occuring.21

—Pulp and paper mills release dioxins to the air and water in the range of 54 to 360 g ITEQ/year. Many mills have implemented process changes to minimize the use of chlorine. The actions sig-

lanuary/February 1995 SOLID WASTE TECHNOLOGIES 37

# SENATE NATURAL RESOURCES Cement Production --Incineration -- 1.0% 1-30-95 Combustors -- 3.1% Incineration -- 0.3% Herbicides -- 4.2% Hazardous Waste Other & Natural --Municipal Waste Medical Waste NATION WIDE DIOXIN CONTRIBUTIONS EXHIBIT NO. Pesticides & 75.8% 0.4% Pelp & Paper --Wood Burning --Metals Production --Motor Vehicles --Generation -- 2.0% 1.3% Electricity 5.8% 5.2%

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# TESTIMONY PRESENTED TO THE MONTANA STATE SENATE COMMITTEE ON NATURAL RESOURCES BY DON RYAN JANUARY 30, 1995

My name is Don Ryan and I'm the Environmental Superintendent for Columbia Falls Aluminum Company. I am asking that SB199 be voted down in committee. I believe there are better ways of accomplishing what the supporters of the bill want while striking a balance which doesn't create an impossible climate for Montana industry in dealing with waste generation.

Columbia Falls Aluminum Company, CFAC, generates a hazardous waste called spent potliner, SPL. Under full production we produce about 4500 tons of this material per year. This waste is about 40% carbon and 60% inorganic which are relatively nontoxic. It is a listed hazardous waste because of small amounts of Cyanide which can leach into ground water if the material is improperly handled.

The SPL has a fuel value of 6000-8000 Btu per pound if incinerated. This is 70%-80% of the Btu content of Coalstrip coal.

There are presently no permitted fuel recovery facilities which can take SPL. The material is sent to Oregon for disposal in a permitted landfill site. That is 4500 tons of 6000-8000 Btu material being buried rather than utilized for it fuel value.

The present cost to CFAC to dispose of this material is approximately \$700,000 per year. In early 1996 the EPA will ban land filling of SPL unless it is pretreated to remove the Cyanide. The one process presently available under the land-ban has to add one ½ pounds of clay to one pound of SPL which is then roasted. This results in 2.5 pounds of treated material, which must be land filled, for every pound of SPL treated. We are figuratively and literally losing ground. The cost to CFAC for this disposal will be \$2.25 million per year.

SB199 is an ostrich approach to the hazardous waste disposal problem. It assumes that passage of the bill will solve our waste problem by effectively legislating that hazardous wastes are shipped to another state. It also eliminates any beneficial reclamation of in-state generated wastes as a fuel source. The 1993 legislature set up a Hazardous Waste Management Working Group under the EQC to provide the 1995 legislature with a better basis for dealing with this problem. Very little consensus was reached because of the diametrically opposed views of the group members. Rather than maintaining an adversarial position, my recommendation would be to determine some point of agreement within the group and work outward.

Can agreement be reached that some wastes such as SPL can be economically and environmentally incinerated for its fuel value?

Are there other wastes which fall into this category?

Let's develop a true working coalition to work actively toward mutually acceptable reclamation

MATERIAL RESUSTALLA

DATE 1- 30-96

EILL 10 58-199

Workers International Union

# Aluminum, Brick and Glass

Box 358 Columbia Falls, Montana 59912

# AFL-CIO-CLC

Local No. 320

(406) 892-4209

Testimony of Raymond R. Sorenson
Columbia Falls, Montana
before the
Senate Committee on Natural Resources
SB 199
Jan. 30, 1995

Mr. Chairman and members of the Committee, I am Raymond R. Sorenson, an officer and a member of local 320, Aluminum, Brick, and Glass International Union. I work at Columbia Falls Aluminum Company.

SB199 would prevent the cement producers in Montana from burning my company's spent potliner. Some people say that this bill is not a "job issue." It could be a "job issue," maybe mine and other good union jobs.

As I understand SB199 it would stop incineration of dangerous wastes by Ash Grove.

This means that a cost-effective method of disposing of (SPL) spent potliner produced by Columbia Falls Aluminum may not be available.

Many people with genuine concerns support this bill. I would share those concerns if I didn't have faith in the professional staff of the State Department of Health and Environmental Sciences.

One thing that concerns me is why this bill was introduced in the first place? The citizens of Montana employ professional staff at the State Department of Health and Environmental Sciences.

I am grateful that we have such people deciding whether or not to issue a permit to burn hazardous waste.

Also, the Governor appoints competent people to the State Board of Health and Environmental Sciences to hear testimony on these issues.

My Union strongly supported the creation of Montana's permitting process. Why? Because we, as workers, are concerned about our safety and the safety of people in our communities. We want to be sure that there is a good process in place so that this pollution will not threaten our lives.



# JERRY NOBLE TIRES

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January	30,	1995 /- 30-9 C
7	,	1995 NO. S B. 199

Jerry Noble, Chairman Environmental Quality Council

I am Jerry Noble, I operate tire dealerships located in Great Falls, Bozeman, Havre and Cut Bank. Also, Chairman of EQC and Harzard Waste Subcommittee.

It is obvious to me after two years of study on Hazard Waste, that Montana needs to have in-state capacity.

The House and Senate and Governor just gave big approval to help Micron. You may want to inquire if they produce hazard waste. If so, and you pass this bill, all your efforts could be for naught.

I would challange all committee members to go out to Ashgrove and review this process first hand before making a rash decision.

I recommend a DO NOT PASS decision on SB199.

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DATE	1-30-95
BILL NO	SB-199

# BERKELEY PIT FACTS AND STATISTICS

# Prepared by Fritz Daily January 23, 1994

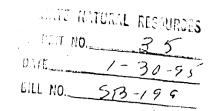
- 1. Pumping was suspended at Butte's Kelley Mine on April 24, 1982
- 2. Water in the Butte mines has risen over 2972 feet since pumping was suspended.
- 3. Water in the Berkeley Pit is currently at a depth of 827 feet.
- 4. The volume of water in the Berkeley Pit is approximately 25 billion gallons.
- 5. Water in the Berkeley Pit fills at a rate of 5 to 7.5 million gallons per day.
- 6. Water in the Berkeley Pit rose 30.5 feet in 1989, 33.2 feet in 1990, 32.8 feet in 1991 (as monitored through the Kelley Mine), 25.2 feet in 1992, 25.97 feet in 1993, and 26.86 feet in 1994.
- 7. EPA documents indicate the water is within 126 feet of contacting the alluvium on the east wall of the Berkeley Pit.
- 8. There are over 3,500 miles of mine tunnels underneath Butte.
- 9. Silver Bow Creek is the headwaters for the Columbia River Basin.
- 10. The Butte mine flooding is the largest mine flooding that has ever taken place in the world.
- 11. The Silver Bow Creek Superfund site is the largest in the United States.
- 12. Silver Bow Creek is a gaining stream and will eventually be contaminated by this water.

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13. Temperature in Butte in 1989 was recorded at a minus 40 degree Fahrenheit. However, the water in the Berkeley Pit did not freeze.

- 14. Water in the Berkeley Pit, as monitored through the Kelley Mine rose 33.2 feet in 1990. Water in the Anselmo Mine rose 31.5 feet. Water in the Belmont Mine rose 33.8 feet. Water in the Stewart Mine rose 33.3 feet. Water in the Granite Mine rose 34.1 feet. Obviously, all of the mines and the Berkeley Pit in the East Camp are hydrologically connected.
- 15. Montana Bureau of Mines documents indicate that water in the bedrock aquifer adjacent to the pit is rising at approximately the same rate as the water in the pit.
- 16. The Berkeley Pit lies atop the Continental Fault. According to recent arricles in Montana Standard and the Montana Magazine, the potential for a serious earthquake in southwestern Montaana is inevitable.
- 17. It was originally projected that the pit would fill to capacity and overtop in 24 years. Projections now vary as to when this will occur. However, as recently as December, 1989, Montana Resources, the current owner of the mine, documented the original projection was close to schedule.

1980-33.80 CURRENT 5,090 1993-25.97 Cottom 4263 1989-30,50 BERKELEY 5,509 JANUARY, 1995 GALLOWS CRITICAL LEVEL 5,410 BEDROCKALLOUML 5,216 FIT STATISTICS Biccios COWTACT



# Comparative Market Analysis SOLD PROPERTIES

Prepared for:
John & Debbie Murray
MCR Saddle Mountain
Montana City, MT 59634

Prepared by:
Bonnie & Dennis Crawford, GRI, CRS
RE/MAX of Helena
1417 1/2 11th Avenue
Helena, MT 59601

	SUBJECT	<u>COMP #1</u>	<u>COMP #2</u>	<u>COMP #3</u>
	MCR Saddle Mounta	Tea Road	McClellan Creck	Rimini Road
Proximity	Saddle Mountain	North Hills	McClellan Creek	Rimini Area
Date Sold		8/15/94	10/14/94	9/15/94
Sales Price		\$305,000	\$270,000	\$248,500
Sq. Footage	Approx. 4,700	Approx. 3,800	Approx. 4,000	Approx. 4,424
Style of Home	Two Story Ranch	Contemporary	Log Home	Contemporary
Effective Age	Newer construction	Unknown	1983	1976
Condition	Very Good	Very Good	Good	Good
# of Bedrooms	Six	Four	Three	Four
# of Baths	2 3/4	2 1/2	2 1/2	Four
Garage	Three Car	Double Car	Three Car +	Three Car +
Landscaping	Mature	Mature	Natural	Natural
Heating	Gas Hot Water	Gas, Propane, Wood	Propane Forced Air	Propane Forced Air
# of Acres	23.5	40	10	40
Basement	Full, Finished	Slab	Full, Finished	Full, Finished
Outbuildings	Yes	None	Yes	Yes
Sprinkler System	Yes	None	None	None

Marketing Pluses: Natural gas heat, custom built home, horse barn with loft, tac room with workshop, covered shelter for equipment, riding arena, paved road up to driveway, heated 3 car garage,

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SENATE COMMITTEE ON Malusa Connece.	
BILLS BEING HEARD TODAY: 53199	

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Dick Van Daly	Ash Grove			
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Leto Kammel	2 (		7	
Shane Jones	Ashgrove			
Boloman	Ashgrove			7
Terry Hiatt	ASHOLOVE			

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SENATE COMMITTEE ON Natural Resources	
BILLS BEING HEARD TODAY: 5 8 199	

Check One

Name	Representing	Bill No.	Support	Oppose
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Terry Mickey	ASH GROVE	1		~
Paul a. Bessler	ash Brown	L		4
Juste & Sanot	Ash Grove	//		V
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Name of Palaneus	Sort	SB199	L	
Aller Lehe	Self	58199	~	
Dual Sall	Sde - Ash Crosse	513-189		
Hulan Bland	self.	SB/99		
BETTY FORE TOP	FAMILYOFT	SB 199	1	
Anne Johnson	MATO.	513 199	V	
Las Johnson	Montanous For A Health, Future	5D199		

DATE/-30-95
SENATE COMMITTEE ON NATURIAL RESOURCES
BILLS BEING HEARD TODAY: 58 199

Check One

Name	Representing	Bill No.	Support	Oppose
Les Lahan	Mt. Daymen Bosn	SB199		
Taru Kan huau	C1	5B 199		
DEALISE HAVMANI	MONTANIANS AGAINST BURN	SB199		
Mile Cok	Davigold	53199		
Jim Jarrow	Mostoners Against Boni	SBIE	₹	· · ·
Fran Chemin	Sols MHE	53199	V	/
Pat Tallent	MHF (Self	5B 199		
Mariann Huso	self/ pakent	20199		V
Tony Huso	ASHCROVE			
Anne Alberts	MT. Assoc. of REALTOR	5B199		
CEDRGEM SCHILLER	Boncernauers D 435		,	1
Jaskie Daggy	Family of 4	SB199	1	
Donkeldren	Ash Grove & Family of 3	50,99		<u></u>
Leanne 7. Doney	Sell + 7 children	1		

DATE	
SENATE COMMITTEE ON NATURAL RESOURCES	
BILLS BEING HEARD TODAY: SB-199	

Check One

Check One				
Name	Representing	Bill No.	Support	Oppose
M/4 R.F. MARGON	JELF	58199	4	
Brad Daggy	Self + Fimily	SD 199	W	
Leonard Wortman	Jeff. Count			
Clenna Obie	Jeff Chy	53 199		
LINDA ABBINS	Se 14	SB199	X	
Jane Briney	5E/f.	SB 199	-	
Willa Hall	SELF. MONTANG LEAGUE OF LW W WHEN VOTES	513199	L	
Connie O'Connar, Me	I description of the second of	SB 199		
Mary Kepler	PTA ,	53199	~	
Satt E. Ellis	Codence Env. Energy, inc	//		1
Allen Sorkley	CFAC	58199		~
Pullia Meichon	20	53199	V	
Roger Thornison	MT DHES	SB199-		
HORDON PALLENT	Self	SB199	/	

5

DATE	
SENATE COMMITTEE ON NATURAL	RESOURCES
BILLS BEING HEARD TODAY:SB	199

Check One

	<b></b>			
' Name	Representing	Bill	Support	Oppose
		No.		
DENNIS ALEXANDER	AMERICAN LUNG ASSOC.	199	V	
DWIGHT MARSHALL	Contraction Contraction	, (		
1 Jon Dect	Sell		~	
Judy Deck	2, 14 and children	199		
Damela P Collins	Sc 1-f + children	199	W	
Carol Conras	Sal E	199	/	
CYNDY MOREY	self	199	V	
Tom Danbert	Ash Grove Count	199		1
Eric Hansen	Ash Grove Cement			سا
Gregory Riso	Ash Grove Conent	199		سا
Kay Miller	sel	199	1	
BORN CUNNINGHM	PISTING OUTFITTERS ASS'UL OF UT.	199	V	
Robert Miller	Self	199	~	
Jeanne / Lell	Sief	199	1	

DATE /-30-95	
SENATE COMMITTEE ON _	NATURAL RESOURCES
BILLS BEING HEARD TODA	Y: <u>SB 199</u>

Check One

Name	Representing	Bill	Support	Oppose
		No.		
Ed Hall	Self	199		
Totallian W. Hall	Self	199	1	
Peggy Trenk	WETA	144		
aretchen Bingman	Self	199	\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	
Maulyn Franci	Seddonson Ctor Plan P.	read 190	,	
Kune Quenemsen	Uloselt 1	199	~	
Ou William	Solf	199	V	
andrew Scherting	Selfa	199	1	7
Diane Lovenzo Vach	pul .	199	V	
AMARA MORRIS	,,	199		
Magaet Petrick	Myself 4 husband	199	V	
antaguenemon	1. SUL	199	L	
Claire Reynolds	Self	199	1	
Baymond & Sorenson	CFAC	199		~

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SENATE COMMITTEE ON NATURAL	RESOURCES
BILLS BEING HEARD TODAY: S	199

Check One

			Cneck	One
Name	Representing	Bill No.	Support	Oppose
Annette Cade	MICHTS/HOOL	199	V	
J.V. Brunett	MTPIRG	199		
Jane Horsen	M. City Bolsol	199	2/	
Beki Brandborg	Amer. Lung Association	199	V	
David Henry	MT Assoc. of Churches	199	V	
Bary Chilcott	Supe-WAY	199	V	
Dawn Chilcott	Sure-WAY	199		
Don Ryan	Colmbea Solls Dunnen	199		
Mauroen Cleary-Schwinder	Women In Farm Econ-	199	7	
David Juan	mT Chamber	199		
PAULSMIETANKA	SELF	199	V	
Gloria Tatchell	suf	199	<b>/</b>	
Sa same Lindbary	Self	199	V	
Windson Lindberg	5e(	199	V	

DATE	<del></del>
SENATE COMMITTEE ON NATURAL	L RESOURCES
BILLS BEING HEARD TODAY:	1° SB 199

Check One

Name	Representing	Bill No.	Support	Oppose
Lex Riggle	myself and family	SB 199		
Downey Koka	Secretary Sheal	SBIPP		
Bill Alle	MT Audubio	SB 199		
Jona Schoonen	Mysel 5	5B 199	W	
Relea Johnson	NEJB	SB199		<u></u>
Andrée lasse	Self & Vamily involate	SB199	V	
Carl Shweitzer		\$ 189	6	
LATRY Brown	Ay Pres. Assa.	SB199	<b>,</b>	
Brand Griffin	VAT Tive Declars	1B199		
Don alla	NA. wolfrolist A	1 -		1
Steve Turkianicz	No Anto Dealers Azen	85,99		~
3. Leipheimer	MI Ado DEHLER ASS	5814		
Leter Funk	self		V	_
Jenuse Kemp	ast Drove			1

# VISITOR REGISTER

PLEASE LEAVE PREPARED STATEMENT WITH COMMITTEE SECRETARY

DATE/ - 3	0.95		7
	EON NATURAL		
BILLS BEING HEAR	TODAY: <u>SB-</u>	199	
< ■ >	PLEASE	PRINT	< ■ >

			Check	One
Name	Representing	Bill No.	Support	Oppose
Dan Roberson	Ash Grove	199		X
Trish Peterson	11 11	199		X
In Che	My Ct School Boy	199	V	