



Department of Health and Environmental Sciences

STATE OF MONTANA HELENA, MONTANA 59601

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Oct. 25, 1977

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Reviewer:

The enclosed addendum to the Department of Natural Resources & Conservation's Colstrip Units 3 & 4 environmental impact statement is submitted to you for your consideration. Comments and questions will be accepted for 30 days after the date of this publication. If no communication occurs during the time period it will be assumed the person or agency does not have any comments. All comments should be sent to the Air Quality Bureau, Environmental Sciences Division, Department of Health & Environmental Sciences, Cogswell Building, Helena, MT, 59601. If additional information or clarification are required please contact Harry Keltz or Tom Ellerhoff, State Department of Health & Environmental Sciences, Helena.

Sincerely,


Michael Roach, Chief
Air Quality Bureau



ENVIRONMENTAL IMPACT STATEMENT

ADDENDUM

COLSTRIP UNITS 3 & 4

COLSTRIP

ROSEBUD COUNTY, MONTANA

OCTOBER 1977

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MONTANA DEPARTMENT OF HEALTH
AND
ENVIRONMENTAL SCIENCES

ENVIRONMENTAL IMPACT STATEMENT ADDENDUM

Colstrip Electrical Generating Units 3 & 4

I. INTRODUCTION

The Montana Power Company, Puget Sound Power & Light Company, Portland General Electric Company, Washington Water Power Company and Pacific Power and Light Company, pursuant to the Board of Health and Environmental Sciences (BHES) Certificate Condition No. 3 and the Department of Health and Environmental Sciences' (DHES) July 19, 1977 Order to Take Corrective Action, filed an application August 17, 1977 for an operating permit and reopened a prior application for a construction permit for the proposed electrical generating units 3 & 4 (Colstrip Units 3 & 4) to be built near Colstrip, Montana. (see attached map #1)

The DHES is responsible for preventing, abating and controlling air pollution in Montana. A construction permit is required by the Administrative Rules of Montana (ARM) 16-2.14(1)-S1400(1), which pertains to permits, construction and operation of equipment. The rule was adopted pursuant to the Clean Air Act of Montana, R.C.M. 1947, S69-3911.

II. ROLE OF MEPA

The review process for the construction of Colstrip Units 3 & 4 by the Department of Natural Resources and Conservation (DNR) began June 6, 1973.

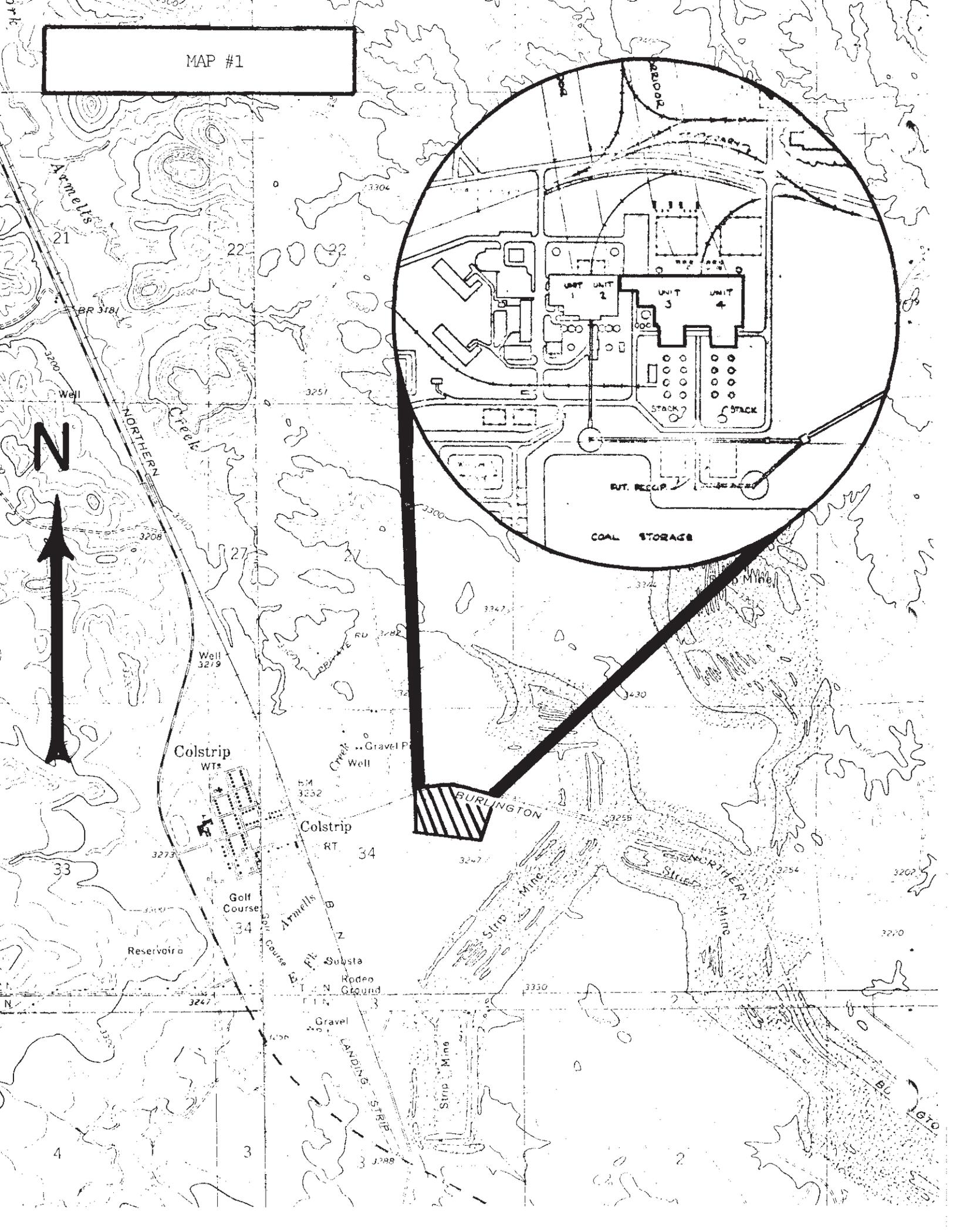
DNR was asked to review the proposed project, as stipulated by the Montana Environmental Policy Act (MEPA), for possible certification of environmental compatibility and public need under the provisions of the state's Major Facility Siting Act.

The provisions of MEPA required the DNR to investigate a wide range of physical and human environmental considerations. To facilitate such a broad study, DNR had to contract with some individuals and agencies to do specialized studies. On October 12, 1973 DNR signed a contract with the DHES to do air quality and radiological studies for the Colstrip draft environmental impact statement (EIS). The next month, November 26, 1973, DNR signed another contract with DHES to conduct water quality studies.

After 17 months of research and writing, DNR circulated its six-volume draft EIS in November 1974. Comments from the draft were evaluated and two months later the department's final EIS was released. Based on its findings and the public comments, the DNR recommended to the Board of Natural Resources and Conservation (BNRC) that the application for a certificate of environmental compatibility and public need for Colstrip Units 3 & 4 be denied.

According to the provisions of the Major Facility Act, the DHES was then asked to determine if the proposed development could comply with air and water quality standards. On April 10, 1975 the DHES notified the BNRC that the Colstrip Units 3 & 4 would not violate water quality standards (the review did not "address" groundwater), but did not certify it would not violate state and federal air quality standards.

MAP #1



The question then arose whether the DHES had the legal authority to certify such standards. The matter was referred to District Court Judge Gordon Bennett who ruled on April 29, 1975 that the proper agency to certify the proposed project was the BHES since a hearing had been requested.

Less than a month after Judge Bennett's decision, May 20, 1975, the BNRC began public hearings to gather more information before making its decision to approve or deny the Colstrip Units 3 & 4 proposal. However, the question of certification by the BHES had not been resolved, so the BNRC hearing was postponed until the BHES held its hearings and made a decision.

The BHES hearings began June 5, 1975 and continued through the summer into early fall. After considering the information in the impact statements, testimony and exhibits, the BHES conditionally approved Colstrip Units 3 & 4, November 21, 1975 (Appendix A).

The BNRC hearings resumed after a seven month lapse in the middle of January. The hearings ended March 30, 1976. Considering the information from the draft and final EIS, the DHES hearings and decision and material from its own hearings, the BNRC conditionally approved the construction of Units 3 & 4, June 25, 1976 (Appendix B).

Even though the review of the proposed project was the first major action of its type, the fact that it took more than three years to process attracted the attention of the state legislature. The legislature's feelings concerning the effort, time and expense required to complete major impact statements, such as the one for Colstrip Units 3 & 4, culminated in the passing of Senate Joint Resolution 14. One of the major goals cited in the resolution was to avoid unnecessary duplication, particularly in cases where the "resource factors" of a study are discussed in an existing study.

The BHES also touched on the subject of a proper but expeditious environmental review at a board meeting June 27, 1977 when it reaffirmed its Condition No. 3 of the certification of Units 3 & 4, but encouraged the DHES to "...expedite the granting of the permit in any way that is possible."

Considering the amount of information which has been generated by hearings and the EIS process, the DHES decided to adopt the DNR's draft and final EIS. In order to consider the air quality information gathered by the DHES and the consortium since the impact statements were printed, the DHES (according to the ARM 16-2.2(2)-P2050 for special rules applicable to certain MEPA situations) decided to write an addendum to the existing EIS.¹

III. ENVIRONMENTAL CHANGES

To determine if the environmental considerations, other than those relating to air quality, in the DNR impact statement had changed, the DHES identified persons who were responsible for preparing major sections in the EISs and asked them to write if

¹The addendum shall include as a minimum: 1) A description of the specific action; 2) any impacts different from those in the original statement; or 3) any impacts not covered in the original statement, and 4) the DHES shall take full responsibility for the contents of the previous EIS and if the department disagrees with certain portions of the previous EIS, the points of disagreement shall be specifically discussed.

such changes had occurred (Appendix C). Letters were sent to 13 persons, September 13, 1977. After 30 days the DHES received replies from seven persons (Appendix D).

IV. TOTAL SUSPENDED PARTICULATE (TSP) ANALYSIS

AMBIENT AIR IMPACT

An analysis of the southeastern coal area (Rosebud, Treasure, Custer, Fallon, Powder River and Carter Counties) was conducted by PEDCO Environmental, Inc. The firm's final report was released last March. The area most intensively studied and analyzed was around the town of Colstrip. The analysis was limited to an examination of air quality data and did not include field work. The data indicates a deterioration of air quality from 1972 to 1976. These increasing particulate concentrations coincided with more industrial activity, such as construction and mining and associated growth in Colstrip.

According to PEDCO the 1976 air quality data show a 46 percent reduction in measured air quality above background was needed to attain the primary National Ambient Air Quality Standards (NAAQS) of 75 micrograms/cubic meter (ug/m^3) and that a 60 percent reduction is needed to attain the secondary standard of 60 ug/m^3 .

PEDCO's report discussed a number of actions which could help alleviate the present situation. The suggestions included:

1. A requirement that surface mining operators submit control plans and specify enforcement provisions. The provisions included reduced speeds and dust control techniques, such as watering.
2. The incorporation of emission density zoning for mines or restrictions in concurrent locations of active mining operations.
3. Planting wind breaks (trees, shrubs, etc).
4. The surfacing of unpaved roads in the Colstrip area.
5. Adequate dust control on public roads near the mines.
6. The establishment of a street cleaning program.
7. The stabilization of inactive and barren areas.
8. The regulation of construction activities to minimize fugitive dust emissions (the report specifies how this should be accomplished).

The construction of Colstrip Units 3 & 4 will result in increased industrial activity and, therefore, rigid control measures are required so as not to exacerbate the existing situation and to provide steps toward the attainment of the NAAQS for particulate matter.

Modeling done by PEDCO indicated the maximum projected contributions from Units 1-4 would be an average of 0.6 ug/m^3 annually. Conclusions drawn from this modeling indicated Units 1-4 will not directly violate standards and will only contribute to the ambient particulate levels in a minor way. However, the locally mined coal burned in Units 1-4 will be major indirect causes of violations, since without the plants there would be no mining or construction.

AMBIENT MONITORING

Presently there are three ambient monitoring stations that have operated in the Colstrip area for a sufficient period of time to establish ambient air quality trends. Two of the stations are operated by the DHES and the other by the Montana Power Company.

The DHES stations are situated southeast of Colstrip. The Burlington Northern (BN) site is 2.8 miles from the town and includes continuous monitoring for sulfur dioxide, oxides of nitrogen, non-methane hydrocarbons, ozone, wind, TSP and sulfates. The second is the McRae site, 14.3 miles southeast of Colstrip. The McRae station only samples for TSP. The DHES has selected a site for a third station approximately a mile east of Colstrip.

The MPC site (MPC #3) is in Colstrip and it samples for sulfur dioxide, nitrogen dioxide and TSP.

The MPC #3 site has shown a significant increase in particulate concentrations since 1974 (Table A). Prior to 1974 the federal primary air quality standard for annual concentrations (75 ug/m³) was not exceeded. Since 1974 the federal primary annual standard has been exceeded every year including the partial year's data for 1977. The maximum annual concentration recorded was 115.2 ug/m³ (only partial year) during 1974. The BN site has also shown a gradual increase in particulate concentrations whereas the McRae site has not shown much of an increase.

The MPC #3 site has also recorded particulate concentrations in excess of the federal primary 24-hour standard (260 ug/m³) every year since 1974, the maximum concentration recorded being 612 ug/m³ recorded in 1974. Neither the BN site nor the McRae site have recorded values in excess of the standards. Since the Montana particulate standards are less than the federal primary standards, the MPC #3 site has also exceeded the Montana standards every year since 1974.

Colstrip Units 1 & 2 were not on line in 1974, therefore they did not contribute to TSP violations at MPC #3 during that year. The two coal-fired generating units went on line commercially in October of 1975 and August of 1976, respectively. Prior to this time they were in a shakedown period of approximately 60 days. Their contribution to the violations at MPC #3 is not known. However, DHES believes that Units 1 & 2 contribute very little to violations due to the fact the highest TSP concentrations were recorded in 1974. Subsequent violations have had lesser values, even though Units 1 & 2 were on line, and no program for dust abatement was initiated until late summer of 1977.

It is suspected that the major contributors to the high levels of emissions now in the Colstrip area include coal handling operations, unpaved roads and construction activity.

OFFSET POLICY

Since the Colstrip area is now in violation of TSP standards, the conditions of the federal offset policy will apply as stated in 41 Fed. Reg. 55524-55530 (see Appendix E).

Basically, the offset policy says the construction of a polluting facility in an area which exceeds NAAQS can only be allowed if emissions from other sources are

TABLE A

TOTAL SUSPENDED PARTICULATE CONCENTRATIONS
FOR COLSTRIP, MONTANA

Values in micrograms/cubic meter

Site	1972		1973		1974		1975		1976		1977	
	Geo. Mean	24-hr. Max.	Geo. Mean	24-hr. Max.								
MPC #3	45.7	166	65.7	190	115.2	612	86.0	413	103.0	428	101.1*	378 ¹¹
BN	-	-	-	-	13.4	119	18.6	129	28.3	104	29.0*	93
McRae	-	-	-	-	11.8	63	9.4	59	16.5	86	14.3 ⁺	102

*Data for January through August 1977 only.

⁺Data for January through June 1977 only.¹¹The consortium's ambient monitoring report for August showed MPC #3 to be in compliance with TSP standards. However, the Colstrip area experienced more rainfall during that period than in previous months this year.

reduced to greater degree than the anticipated emissions from the new facility. A specific emission limitation number in tons per year or pounds per hour must be specified.

An outline of the offset policy as it applies to Colstrip Units 3 & 4 includes:

A. A review of all proposed new sources for emission limitation compliance. This means a preconstruction review.

B. A review of major sources for their impact on air quality. The reviewing authority must determine if the construction of major facility will exacerbate an "existing " violation of an NAAQS as of the source's proposed start-up date. Major source is defined as a facility capable of emitting to the atmosphere 100 tons per year or more of pollutants (TSP, SO₂, NO_x, Non-methane hydrocarbons).

C. The determination of whether a source will cause or exacerbate a violation of an NAAQS shall be made on a case by case basis as of the proposed new source's operation date using the best available information and analytical techniques available. This determination shall be independent of any general determination of nonattainment or judgment that the State Implementation Plan (SIP) is substantially inadequate to attain or maintain the NAAQS.

Conditions for the location of a source which exceeds NAAQS would be:

A. In order for a new source to locate in an area which already exceeds NAAQS it must meet stringent emission limitations. The lowest achievable emission rate possible for that type of source in tons/year must be met. At a minimum, the lowest emission rate achievable must be specified unless the source can sustain the burden of demonstrating that it cannot achieve such a rate.

B. The applicant must certify that all existing sources owned or controlled by the owner or operator of the proposed source in the same Air Quality Control Region (AQCR) are in compliance with all applicable SIP requirements or are in compliance with an approved schedule or timetable for compliance under a SIP or an enforceable order under Section 113 of the Federal Clean Air Act.

C. Emission reductions (offset) from existing sources in the area of the proposed source (whether or not under the same ownership) are required so the total emissions from the existing and proposed sources are sufficiently less than the total allowable emissions from the existing sources under the SIP prior to the request to construct or modify, thus representing reasonable progress towards attainment of the applicable NAAQS.

D. The emission effects will provide a positive net air quality benefit in the affected area.

E. For a source which would be located in an area where Environmental Protection Agency (EPA) has found that a SIP is substantially inadequate to attain an NAAQS and has formally requested a SIP revision pursuant to Section 110 (a)(2)(H)(ii) (or an area where EPA has called for a study to determine the need for such a revision) permits granted on or after January 1, 1979, must specify that the source may not commence construction until EPA has approved or promulgated a SIP revision for the area (if the source is a major source of the pollutant subject to the call for revision or study.)

The Federal Register Volume 41, No. 132, Thursday, July 8, 1977, has determined that the Montana SIP is substantially inadequate to attain and maintain the National primary and secondary standards for TSP in the Southeast Montana Coal Resource AQMA.²

All items as spelled out in the Federal Registers do not apply as in some cases they are preempted by subsequent changes in the Federal Clean Air Act Amendments.

The Interpretative Ruling regarding EPA's offset policy has been amended by the 1977 amendments to the Federal Clean Air Act. A copy of those amendments may be acquired from DHEC, Cogswell Building, Helena.

DUST ABATEMENT EVALUATION

The consortium's representative, MPC, has submitted a compliance plan (Appendix F) for reducing dust levels and implementing the offset policy in the Colstrip area. The plan consists of surfacing unpaved areas, applying stabilization techniques, street cleaning and the use of perennial vegetation in the immediate area of the power plant complex. The consortium also plans to cooperate with public dust control efforts.

MPC is also attempting to identify the source of particulate pollutants by scientific analysis.

The dust abatement program did not indicate the expected TSP reduction (ton/yr), nor mention how much area is involved, or list a specific timetable.

To comply with the offset policy, specific tonnage reductions in particulate pollutants must be specified and followed. This particulate reduction must offset, by more than 1 to 1, the anticipated increases in particulate emissions caused by the operation of Colstrip Units 3 & 4.

The abatement equipment (Venturi scrubbers) proposed for Colstrip 3 & 4 are adequate to achieve low particulate emission rates for the coal-fired boilers. However, the DHEC believes that the existing coal handling facilities do not represent the lowest achievable emission rate for that type of source. Additional control on these facilities will be required.

Handling, storage and transportation of coal at the Western Energy mine to Colstrip Units 1 & 2 are sources of TSP problems. Areas of present concern are the crushing at Western Energy, and coal stackers at both Western Energy and MPC. During windy days coal dust and road dust from coal trucks also present a problem. (A source of air pollution apart from Colstrip Units 1-4 plants) The DHEC will require MPC to implement an offset greater than 1 to 1 prior to the operation of Units 3 & 4.

V. OPERATING AND CONSTRUCTION PERMITS

OPERATING PERMIT

The operating permit application states the applicants will operate the plants according to their testimony during the DHEC hearings in 1975. The DHEC cannot evaluate an operating permit for the applicants until the facility has been constructed.

²Federal Register, Dec. 21, 1976, Vol. 41, No. 246, "EPA: Part 51 - Requirements for Preparation, Adoption, and Submittal of Implementation Plans," PP. 55524-55531; and "EPA: Review of New Sources and Modifications," PP. 55558-55560.

CONSTRUCTION PERMIT

At the time of the original application, time constraints (as imposed by R.C.M. 69-3911 Permits, which have since been amended), and hearings before the BHES forced the DHES to deny the permit with the provision that the consortium could complete the application. Since then, new information has been accumulated, enabling the consortium to resubmit its request for a construction permit (Appendix G).

The operation of Colstrip Units 1 & 2 proved to be a major source of new data. Information taken from daily operations has been presented to the DHES monthly since January 1976.

In addition to the daily plant data, the DHES has eight source test reports for Unit 1 and five source test reports for Unit 2. Additional tests have been performed by the consortium's contractor, but not all of the information has been presented to DHES.

According to the test data received from the consortium, Colstrip Units 1 & 2, which have the same principal engineering design as Units 3 & 4, were in compliance with all applicable emission standards during the times of testing. DHES tests on Unit 1 in February 1976 also found the plant was operating in compliance with established standards.

VI. DESCRIPTION

The consortium proposed to construct two 778 megawatt (MW) coal-fired generating units. The proposed locations of Colstrip Units 3 & 4 is east of Colstrip in Section 34, Township 2 North, Range 41 East, Rosebud County.

According to the utilities, the plants would each contain a steam generator capable of producing approximately 5,000,000 pounds of steam per hour. Each unit would also have a 778 MW turbine generator, an evaporative, cross-flow induced draft cooling tower, a stack at least 500 feet high and alkali scrubbers for air pollution control. The units would each require approximately 885,000 to 903,000 pounds of coal per hour depending on the BTU content. It is proposed that the coal will be obtained by strip mining a nearby area at a rate of about 130 acres a year.

VII. POLLUTION CONTROL ANALYSIS

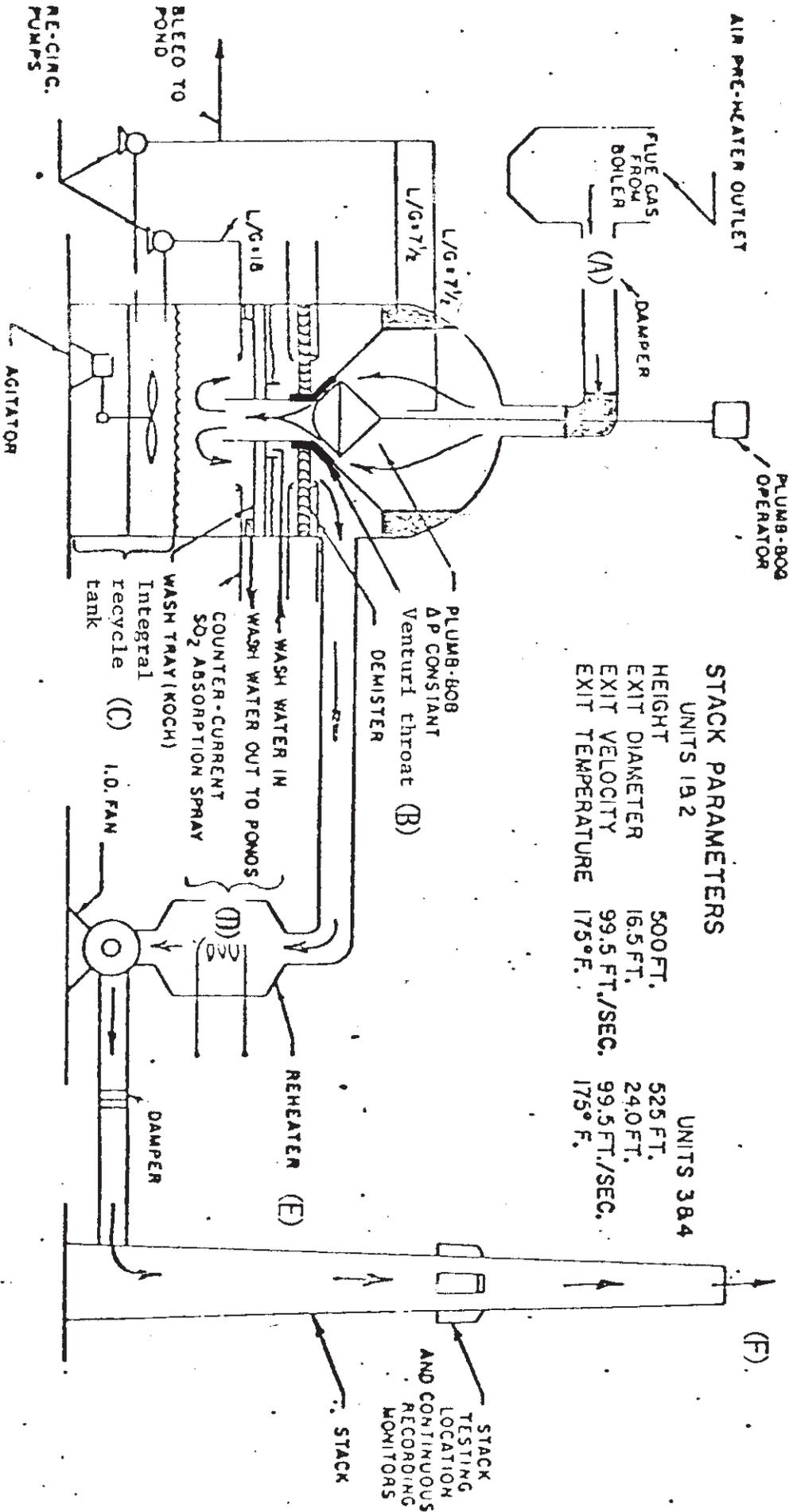
The applicants propose to construct two 778 MW power plants with Venturi scrubbers as the pollution control devices.

SCRUBBER SYSTEM

The scrubber system for each plant will consist of eight Venturi scrubbers; seven will be operational full time with one spare. This means that when a plant is at 100% load, seven scrubbers will be operational.

Each scrubber vessel will handle approximately 14.3% of the effluent gases emanating from the boiler or more than 480,000 cu. ft/min. The above flow rate conditions are at 268° F and 25.37 inches of mercury. The scrubber vessel consists of a Venturi throat, automatic or manual plumb bob control, counter current sprays, mist eliminators, recycle tank, recycle pumps, steam coil type reheater, soot blowers, induced draft fan, effluent liquor pumps and lines and pond return pumps (Diagram A).

TYPICAL VENTURI WET SCRUBBER



DESCRIPTION OF SCRUBBER OPERATION

Flue gas from the boiler (Diagram A - (A)) first passes down through the Venturi throat section (B) and is mixed with the liquor, the liquor drops into the integral recycle tank (C) with the absorbed ash and some absorbed sulfur dioxide. Gas then passes upwards through sprays and demisters where downward flowing liquor completes the sulfur dioxide absorption (D). The liquor again drops out into the recycle tanks. The gas passes on through a reheater (E) before entering the induced draft fan (I.D.) and then exits out the stack (F). Spent liquor is pumped to an ash disposal pond by effluent liquor pumps and clear water is returned to the cycle by pond return pumps.

OPERATING PARAMETER

Each scrubber vessel with its ensuing components is designed to operate at a pressure drop of 17.5 inches of water and a liquid to gas (l/g) ratio of 35. This means that every 1000 ft³ of boiler exhaust gas is cleaned by 35 gallons of scrubbing liquor each minute.

Scrubber liquor is designed to maintain a suspended solids content of 6-12% with a pH of 5.6. To maintain the pH at a proper level lime facilities are required. Additional lime will be necessary from time to time to aid the natural alkalinity of the fly ash.

The reheater will raise the temperature of the saturated gases at least 50° F and an increase of approximately 15° F will be achieved across the I.D. fans resulting in a stack exit temperature of about 190° F.

Exit velocity of the stack gases from the 525 ft. stacks is anticipated to be 99.5 ft/sec.

NITROGEN OXIDES CONTROL SYSTEM

The function of nitrogen oxides (NO_x) control system is to reduce the amount of NO_x produced during the combustion of pulverized coal in the boiler.

This system will consist of overfire air compartments with associated ducting, air dampers, and combustion controls. In operation, this system functions to decrease combustion temperature and nitrogen oxides production by increasing the volume of the fireball region in which combustion takes place. This is accomplished by installation and control of overfire air compartments which spread the supply of combustion air over a larger volume.

EMISSION LEVELS

Colstrip Unit 1 source test data has generally shown that particulate matter, sulfur dioxide and oxides of nitrogen emissions range from 28-40%, 12-35%, and 42-58% respectively, of the allowable emission standards. Loads during the times of testing ranged from 180 to 354 MW.

Source tests conducted on Colstrip Unit 2 have almost always been at greater than 90 percent load and those ranges of emissions for particulate matter, sulfur dioxide, and oxides of nitrogen were, respectively, 28-55%, 16-36% and 36-58% of allowable emission levels.

One-hundred percent load is 358 MW. Units 1 & 2 have been as high as 354 and

335 MW, respectively, during the times of testing.

Drawing conclusions for the operation of Colstrip Units 3 & 4 based upon information from source tests on Units 1 & 2 should be approached with caution. Colstrip Units 1 & 2 do not burn Rosebud area C coal, which is higher in sulfur than the coal now being burned. Area C coal will be burned in Units 3 & 4. However, an analysis will be made to evaluate whether the efficiencies obtained on Units 1 & 2 are best available control technology and should be required of Units 3 & 4. Table B shows a number of scrubber availability figures taken from the operation of Units 1 & 2. Appendix H is an EIA report on source testing at Colstrip.

EMISSION MONITORING

Presently, the applicants are considering SO₂ monitors, inlet and outlet, for each scrubber vessel in each plant. This would mean a total of 16 SO₂ monitors per plant in addition to the opacity, NO_x and SO₂ stack monitors. However, the consortium permit application does not mention what type or number of emission monitors that will be installed in Units 3 & 4.

The emission monitoring programs at Colstrip Units 1 & 2 have been plagued by numerous problems since startup. Because of those problems the DHES on June 27, 1977, made specific recommendations to the BHES concerning certification of the monitors. Those recommendations outlined which monitors were to be certified and by what dates. Final certification for all monitors was to be by October 15, 1977; however, circumstances have prevented all monitors from meeting this specific date. A copy of the complete report with recommendations is attached along with the present progress reports MPC has submitted in its behalf. Item No. 5 of the DHES recommendations was not considered by the BHES.

The latest maintenance report of May 24, 1977, along with a copy of an EPA report on emission monitoring and the DHES status report of June 27, 1977, are also appended (Appendices I, J and K).

A monitor certification update report as required by DHES has also been submitted (Appendix L).

VIII. PERMIT EVALUATION

The proposed construction permit will be evaluated with respect to:

1. Best Available Control Technology (BACT)/Lowest Achievable Emission Rate (LAER).
2. The degree of emission control obtained by Colstrip Units 1 & 2 according to source test data now available for particulate matter, sulfur dioxide and nitrogen oxides.
3. The results of a statistical analysis on monthly operating reports for Colstrip Units 1 & 2, which includes emission monitoring equipment. Those reports include as a minimum:
 - a. Gross and net kilowatt hours.

TABLE B

SCRUBBER AVAILABILITY INFORMATION

<u>Month</u>	<u>Unit No. 1</u>	<u>Unit No. 2</u>
January 1976	91.8	N.A.
February 1976	98.4	N.A.
March 1976	98%	N.A.
April 1976	72.4	N.A.
May 1976	96.8	100%
June 1976	N.A.	99.7
July 1976	93.2	98.7
August 1976	88.3	95.8
September 1976	88.6	98.3
October 1976	79.9	90.3
November 1976	62.7	94.7
December 1976	73.8	92.5
January 1977	86.1	83.4
February 1977	95.4	93.8
March 1977	off-line	96.7
April 1977	83.0	84.5
May 1977	85.4	100 (3 days)
June 1977	87.4	87.8
July 1977	85.1	90.6
August 1977	93.3	81.

- b. Gross and net frequency distribution (now discontinued).
 - c. Hours on line.
 - d. Lime Consumption.
 - e. Number of scrubbers operating.
 - f. Maximum, minimum and average scrubber pressure drop (maximum and minimum have now been discontinued).
 - g. Maximum, minimum and average scrubber slurry pH (maximum and minimum have now been discontinued).
 - h. Coal consumption: tons/months.
 - i. Coal analysis, BTU's, ash, moisture and sulfur (proximate analysis).
 - j. Temperature differential (ΔT) across reheaters (usually an increase of 50 to 75 °F).
 - k. Temperature differential (ΔT) across induced draft fans (approximately 15° F).
 - l. Stack temperature.
 - m. Scrubber availability.
 - n. Stack monitoring data; opacity, NO_x, and SO₂. Average and peak values are reported for each day of the month. Operators at the plants take readings about every two hours during a 24-hour day. Monitoring data has been amended to include scrubber inlet SO₂ readings.
 - o. Reports on certain items if malfunctions, unusual conditions or maintenance affects air pollution levels or the scrubbers. Maintenance reports on Units 1 & 2 have not been timely.
4. The adequacy of an emission monitoring program that will provide at a minimum 16 in plant SO₂ monitors; 1-NO_x, 1-opacity and 1-SO₂ in-stack monitors; interim pyritic sulfur monitoring and integrated coal sampling. At this time the applicants have not indicated choice of equipment or vendors for the emission monitoring system.
5. Predicted concentrations of SO₂ in the ambient air not exceeding those which were presented before the BHES in 1975. According to that testimony the applicants will meet all applicable state and federal ambient air standards. The applicants predicted that the highest concentrations of SO₂ will be 298 ug/m³ (~0.11 ppm) for a one-hour average and 67 ug/m³ (0.026 ppm for a 24-hour). The applicable state standards are 655 ug/m³ (0.25 ppm) and 262 ug/m³ (0.10 ppm), respectively. Since that time modeling has indicated the plants cannot meet Class I increments on the Northern Cheyenne Reservation. Responsibility for this review is with the EPA.
6. Meeting the offset policy described in Vol. 41 Federal Register PP. 55528-55530. Mass emissions of particulate matter are not expected to cause violations of the state or federal ambient air standards by themselves although they would add to the burden of an area already in violation of TSP.

The design concept of Units 3 & 4 is similar to Units 1 & 2 and those units are designed to meet or better the Federal New Source Performance Standards which are:

- a. 1.2 lbs of $\text{SO}_2/10^6$ BTU's fired.
- b. 0.1 lbs of particulate/ 10^6 BTU's fired.
- c. 0.7 lbs of $\text{NO}_x/10^6$ BTU's fired.

The emission limitation guarantees are 1.0 lbs of $\text{SO}_2/10^6$ BTU's fired, 0.054 lbs of particulate/ 10^6 BTU's fired and 0.7 lbs of $\text{NO}_x/10^6$ BTU's fired.

The applicable visual limitation for coal-fired power plants is 20% opacity except excursions of 40% opacity are allowed for two minutes each hour.

IX. POSSIBLE COURSES OF ACTION

1. Deny the permit if the consortium;

A. Violates the BHES' conditions for conditional certification.

B. Fails to meet state and federal air quality standards for which the State has been delegated responsibility.

2. Unconditionally approve the permit.

3. Conditionally approve the permit with the provision that additional conditions may be imposed upon completion of the evaluation and receipt of recommendations from the review of the addendum. Conditions for approval would require:

A. Ambient air SO_2 concentration of 0.25 ppm for a 1-hour average and 0.10 ppm for a 24-hour average shall be met, in addition to all other applicable ambient standards.

B. Emission offsets shall be greater than 2537.6 tons/yr and the offset emission reductions shall be specified and achieved before Units 3 & 4 commence operation.

C. To further clarify and resolve BHES condition No. 3 the consortium will conduct a pyrite sulfur study on Colstrip Units 1 & 2. The study will begin on or before January 1, 1978 and run for no less than one year and no longer than two years. Details are to be worked out between the DHES and the utilities' representative, MPC.

D. Limitations on particulate and SO_2 emissions so as to reflect BACT as demonstrated on Units 1 & 2. These limitations shall be met at all times during normal plant operation except as provided for under malfunction, start-up and shutdown conditions.

E. A compliance plan for reducing those emissions associated with the crushing, storing and transporting of coal from the Western Energy mine to the power plant complex which demonstrate "Lowest Achievable Emission Rates."

F. MPC shall provide a detailed emission monitoring program for DHES approval one year before Units 3 & 4 commence operation. Procedures for certifying said monitors shall be as outlined in the October 6, 1975, Federal Register and subsequent amendments to those procedures.

X. RECOMMENDATION

The DHES in reviewing the proposed options recommends that conditional approval be granted for Colstrip Units 3 & 4.

A P P E N D I X A

BOARD OF HEALTH & ENVIRONMENTAL SCIENCES
CONCLUSIONS OF LAW



APPENDIX A

BOARD OF HEALTH & ENVIRONMENTAL SCIENCES

COLSTRIP UNITS 3 & 4

CONCLUSIONS OF LAW

The Board concludes, based upon the testimony, and the exhibits in the record before it, that the proper procedure for it is to grant conditional certification for Colstrip Units 3 and 4 subject to possible suspension thereof.

1. The applicants' will utilize only coal from the Rosebud seam. It will at no time exceed 1% inlet sulfur content. Daily testing of the coal and sulfur content will be required to effect that control.

2. The operation of the air quality system in Colstrip #1 will be closely monitored by the Department of Health and Environmental Sciences and the applicants. The data therefrom is to be interpreted by the Department as to the effectiveness of such system of control of air quality. This monitoring will be continuous during the construction of Units #3 and #4. In the event Colstrip #1 violates the compliance standards during its operation and performance, certification of Colstrip Units #3 and #4 will be suspended pending the implementation of modifications in Colstrip Unit 1, 2, 3, and 4 to bring the units into compliance.

3. The certification with conditions herein set forth does not constitute a waiver of any of the requirements of the Clean Air Act, the Water Pollution Control Act, or the implementation plan, including the necessity of obtaining a permit in accordance with the rules and regulations implemented under Section 69-3911, R.C.M. 1947.

4. Any compliance modifications required during the operations of Colstrip Units 1 or 2 will be installed in Colstrip Units 3 and 4.

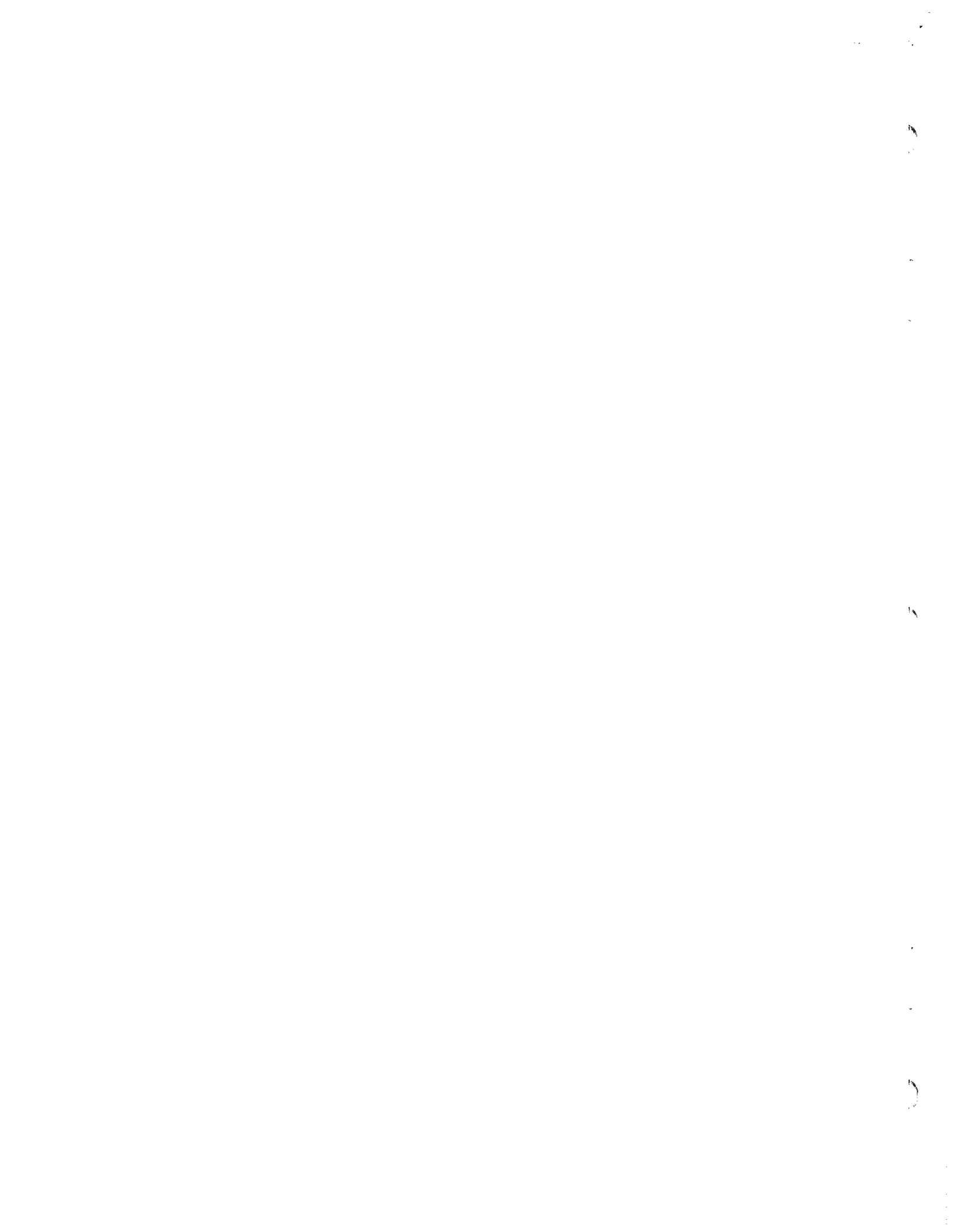
5. No water will be withdrawn from the Yellowstone River when the Yellowstone River is flowing at Nichols less than 1,500 cubic feet per second. Daily testing will be required during periods of low water.

6. All ponds, surge ponds, settling ponds, and impoundments shall be properly sealed. They shall be monitored for seepage, including the installation of test well to determine the extent of ground water pollution, and the necessities of correction therefor.

Dated this 21st day of November, 1975.

MONTANA BOARD OF HEALTH AND
ENVIRONMENTAL SCIENCES

By/s/ John W. Bartlett



A P P E N D I X B

BOARD OF NATURAL RESOURCES & CONSERVATION
CONCLUSIONS OF LAW



APPENDIX B

BOARD OF NATURAL RESOURCES & CONSERVATION

COLSTRIP UNITS 3 & 4

CONCLUSIONS OF LAW

1. That Applicants have met the burden of proof required herein and that each finding of fact set forth herein is supported by substantial credible evidence contained in the record of these proceedings.

2. The Board hereby adopts all of the Findings of Fact and Conclusions of Law heretofore entered in this proceeding by the Montana Board of Health and Environmental Sciences and dated November 21, 1975.

3. There is a need for the energy that will be produced from Colstrip Units #3 and #4.

4. The facility, Colstrip Units #3 and #4 and associated facilities, represents the minimum adverse environmental impact considering the state of available technology and the nature and economics of the various alternatives.

5. The probable environmental impact from the construction and operation of the facility will be minimal.

6. All of the requirements and criteria of the Montana Utility Siting Act of 1973, including but not restricted to Sections 70-810, 70-811, 70-816, Revised Codes of Montana, 1947, have been met, satisfied and complied with by the Applicants.

7. Colstrip Units #3 and #4 and associated facilities are consistent with regional plans for expansion of the appropriate grid of the utility systems, such facilities will serve the interests of utility system economy and reliability, and none will be constructed underground.

8. The location of Colstrip Units #3 and #4 and associated facilities as proposed conforms to applicable state and local laws and regulations issued thereunder.

9. Colstrip Units #3 and #4 and associated facilities will serve the public interest, convenience and necessity.

10. The only authorized state air and water quality agency, the Board of Health and Environmental Sciences, has certified that the proposed facility, Colstrip Units #3 and #4 and associated facilities will not violate state and federally established standards and implementation plans.

11. There are not available any viable or reasonable alternatives to the proposed facilities.

12. That the Board of Natural Resources and Conservation grant the application requested and issue a certificate of Environmental Compatibility and public need required by the Utility Siting Act of 1973 subject, however, to the following terms and conditions, to-wit:

a. That the Applicants take what measures are necessary through the enlargement of existing ponds or the construction of additional surge pond facilities so as to ensure a fifty (50) day supply of water at all times, for the operation of the four Colstrip units.

b. That the Applicants, at their expenses, shall in full cooperation with the Montana Department of Fish and Game, the Montana Department of Natural Resources and Conservation, and the Montana Department of Health and Environmental Sciences, construct, maintain and operate a water gauging station, at the point of withdrawal of water from the Yellowstone River at Nichols, Montana, or just upstream from said withdrawal point, that will measure the daily flow of water at said point of withdrawal, and that the Applicants shall furnish all measurements on a periodic basis to the Montana Department of Fish and Game, the Montana Department of Natural Resources and Conservation, and the Montana Department of and State Board of Health and Environmental Sciences.

c. That the seepage from the existing surge pond and any enlarged or additional surge ponds be monitored, as specified by the State Board of Health and Environmental Sciences, and that every feasible engineering means be taken by the Applicants to minimize such seepage.

d. That the sludge pond or ponds shall be completely sealed. If the conventional means such as compaction and bentonite application do not seal the pond(s), as indicated by monitoring wells the Applicants shall install and operate, then extreme measures even up to complete sealing by a plastic membrane shall be taken.

e. That the reclamation of the sludge ponds, when they are filled and dried out, shall follow the basic reclamation requirements and standards applicable to the proper covering of highly saline back-fill in coal areas.

f. That the Applicants' general contractor, Bechtel Corporation, shall attempt to work with the Northern Cheyenne Tribe, and its members, in an effort to establish training programs to develop skilled labor among the Northern Cheyenne tribal members to the end that said Northern Cheyenne tribal members may be usefully employed during the construction of and subsequent operation of Colstrip Units 3 and 4.

g. That the Applicants, at their expenses, shall in cooperation with both the Montana Department of Health and Environmental Sciences and the Tribal Council of the Northern Cheyenne Tribe, construct, maintain and operate an air quality monitoring station on the Northern Cheyenne Reservation as part of the total air quality monitoring program, and further that the Applicants shall compile, collect and furnish all of the results of said monitoring station on a periodic basis to the Department of Health and Environmental Sciences and to the Tribal Council of the Northern Cheyenne Tribe.

h. That all monitoring programs heretofore instituted in regard to Colstrip Units 1 and 2, and in the Application proposed, be implemented and instituted so as to provide a continual flow of factual data insofar as air, surface and ground water are concerned.

i. That the Applicants enter into a written agreement with the Board of Health and Environmental Sciences for the payment of the monitoring facilities and operation thereof required by said Board in their certification heretofore issued, and for any further monitoring required in the conditions set forth herein by the State Board of Natural Resources and Conservation.

j. That as and when Units #3 and #4 come on line, the Applicants and the Department of Health and Environmental Sciences shall set up by a new agreement a reasonable continuing schedule of monitoring, covering sites, kinds of tests, frequency of tests, and other matters deemed necessary, to maintain the integrity of the monitoring system in determining compliance or non-compliance with the Montana Air Quality standards over a long period of time.

k. That the Applicants prepare and transmit a written offer to each of the Montana Rural Electric Cooperatives offering said Cooperatives an opportunity to purchase ownership in the proposed Colstrip Units 3 and 4, which ownership shall be in such amounts as may be mutually agreed upon by and between the Applicants and the Cooperatives, individually or collectively, desiring to purchase such ownership, which will be sufficient to meet the projected energy demands placed on the Cooperatives.

l. That relative to the transmission facilities:

1. The Applicants are recognized as responsible for all aspects of said construction, irrespective of how they may sub-contract the work.

2. The Applicants shall develop a set of construction Guidelines which must be approved by this Board, and they must do so and receive approval before transmission line construction commences. This recognizes that the Colstrip-Broadview segment is covered by previous Conclusions from this Board, relative to the 230 KV line. However, whatever must be done to upgrade that segment to 500 KV must comply with the Construction Guidelines. These Construction Guidelines must not only stipulate construction practices which will minimize environmental damage, but must also cover the reclamation of unavoidably or accidentally damaged land or water resources. As part of the contracts or sub-contracts relative to transmission line construction, the Applicants shall stipulate compliance with the Construction Guidelines, and a performance bond shall be required covering not only construction aspects but also reclamation aspect. Details of the Bonding shall be set forth in the Construction Guidelines.

3. The Applicants shall continue to gather both geologic and meteorologic data for the area of the proposed corridor and submit the same to the Department of Natural Resources and Conservation for its review, so as to determine the proper design and location of the transmission line towers in areas of severe meteorological occurrences, with specific references to the problems of the accumulation of ice

and problems of high velocity winds.

4. The final location of the center line of the right-of-way of the Transmission line is subject to the future approval of this Board. Specific means and procedures shall be worked out with this Board for the approval process. The selection of the final center-line location shall as far as possible avoid skylining, will skirt bases of hills, will avoid closely paralleling main highways, will avoid crossing irrigation or potential irrigation lands except on property boundaries, will cross roads and streams directly rather than obliquely, and will otherwise minimize the impact of those lines.

5. The final proposed location of the centerline for the transmission facility, associated with Colstrip Units #3 and #4, shall be located in cooperation with the consultation with the individual land owners whose land the said transmission facility passes over, through and across so as to mitigate the effects of said transmission facility on the individual land owners. When the Applicants submit the final proposed location of the center-line for the final approval by this Board, they shall include information substantiating compliance with this related Condition.

6. The features of design of the Transmission lines shall be as stated by the Applicants' Findings, and by any modifications which may mitigate geologic, seismic, or meteorologic problems.

m. That the conditions set forth in pp 22 and 23 in the Findings of Fact of the State Board of Health and Environmental Sciences of the State of Montana are hereby fully and completely incorporated as conditions herein.

n. That the Applicants make every effort, and report periodically to the State Board of Health and Environmental Sciences on those efforts, to continually increase the efficiency of the air pollution control system, by adopting or adapting new technology.

Dated this 22nd day of July, 1976.

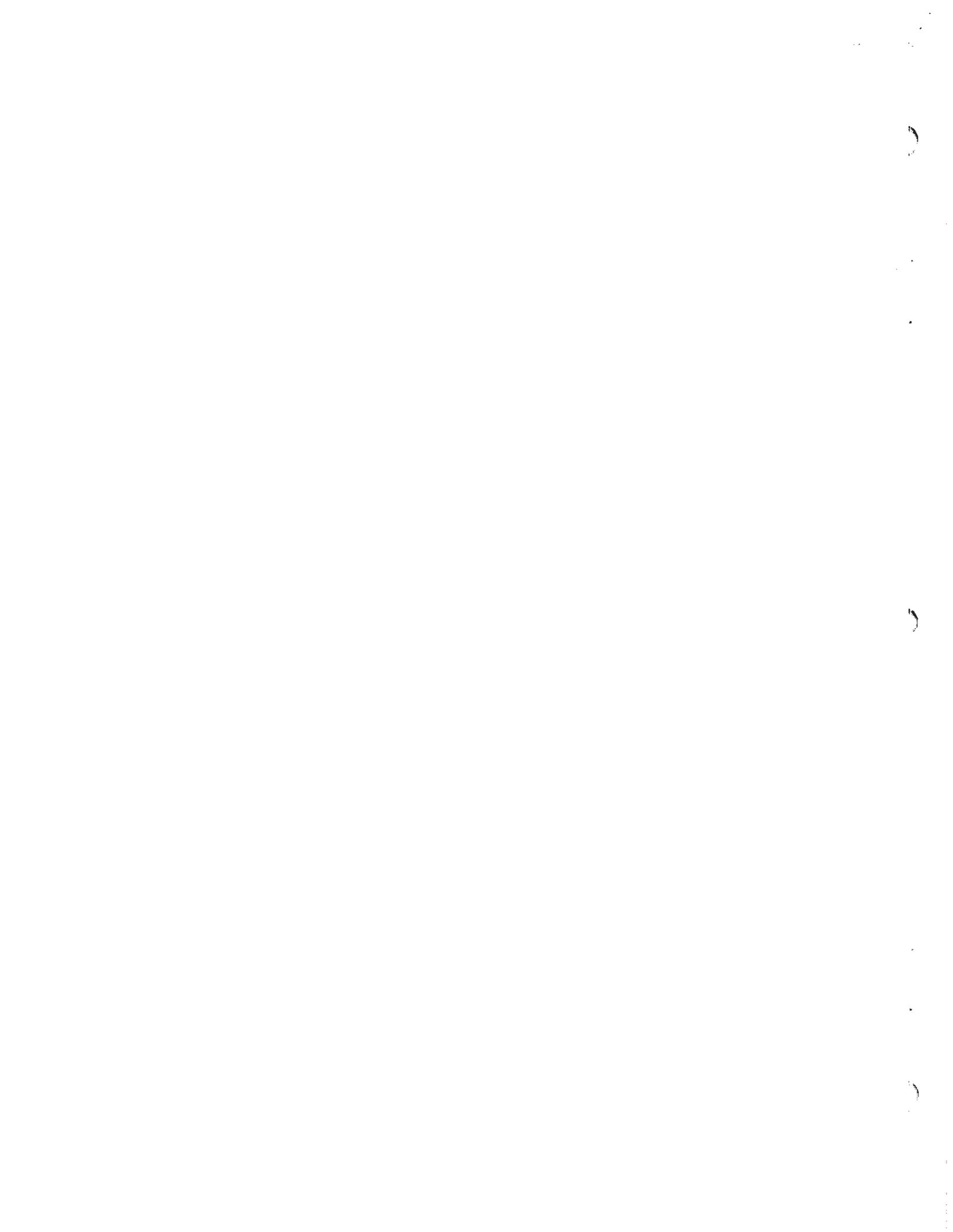
MONTANA BOARD OF NATURAL
RESOURCES AND CONSERVATION

By/s/ Joseph W. Sabol

CHAIRMAN

APPENDIX C





ENVIRONMENTAL SCIENCES DIVISION
Board of Health Building
(406) 449-3946

A. C. Knight, M.D.

XXXXXXXXXX
XXXXXXXXXX

September 13, 1977

The Montana Power Company, Puget Sound Power & Light Company, Portland General Electric Company, Washington Water Power Company and Pacific Power & Light Company have asked the Department of Health and Environmental Sciences to review construction and operating permit applications for Colstrip Electric Generating Units 3 & 4.

To meet what appears to be the requirements of the Montana Environmental Policy Act and Clean Air Act, the department plans to write an addendum to the Department of Natural Resources and Conservation's Colstrip 3 & 4 environmental impact statement.

Since it has been nearly four years since you participated in the Colstrip environmental study, we felt it would be appropriate to ask if you wish to update, add or revise the you prepared for publication. If we do not receive a return letter by October 7, we will assume you have no changes.

If you have comments, please send them to: Thomas M. Ellerhoff, Environmental Sciences Division, Department of Health and Environmental Sciences, Board of Health Building, Helena, MT, 59601.

Thank you.

Sincerely,

Thomas M. Ellerhoff
Technical Writer

TME:dmg

Jim Posewitz, Administrator
Ecological Services Division
Dept. of Fish & Game
Helena, Montana 59601

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Conservation
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Energy Planning Division
Dept. of Natural Resources
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Stephen C. Kologi, P.E., Chief
Preconstruction Bureau
Department of Highways
Helena, MT 59601

C. R. Draper, Administrator
Research & Information Systems
Division
Dept. of Community Affairs
Helena, MT 59601

A P P E N D I X D

C O R R E S P O N D E N C E





UNIVERSITY OF MINNESOTA
TWIN CITIES

Lee F. Werth
College of Forestry
Department of Forest Resources
110 Green Hall
1530 N. Cleveland Avenue
St. Paul, Minnesota 55108

October 2, 1977

Thomas M. Ellerhoff
Environmental Sciences Division
Department of Health and Environmental Sciences
Board of Health Building
Helena, Mont. 59601

Dear Tom:

I appreciate the opportunity to make additional comments to the proposed construction of Colstrip Electric Generating Units # 3 and # 4 and associated 500KV dual transmission lines.

Acid rain resulting from sulphur dioxide emissions combining with water vapor in the air is very much a threat to terrestrial and aquatic ecosystems within the vicinity of Colstrip and considerable distance beyond. Colstrip Units 1 and 2 already have or will be spewing tons of sulphur dioxide into the relatively clean eastern Montana air. Increased emissions from Colstrip 3 and 4 may adversely effect revegetation efforts on strip mined lands and may in fact be the straw that broke the camel's back on already stressed reclamation vegetation. The extent of vegetation damage will depend on the species used for reclamation and the ability of the soil system to act as a buffer to acid precipitation. Research recently completed in eastern U.S., Norway and Sweden revealed that acid rain from fossil fuel power plants is indeed a "real" phenomenon that should be reckoned with.

The associated dual 500 KV electric transmission lines from Colstrip to Hot Springs could possibly increase the fire danger near the lines and retard growth in some plant species through dissection. An individual from a power company in Northeastern U.S., who wishes to remain anonymous, stated that a fire started underneath an existing 500 KV transmission line and when workers attempted to cut down trees adjacent to the line, they were almost electrocuted. The power was shut off in the line and close examination of the trees revealed that electric current (electrostatic induction) had passed from the outer conductors, through the air, into the trees (charred the cambium), passed through the roots, into the soil and then ignited shrubs and grasses underneath the 500 KV transmission line. This same individual stated that some species of trees along the margins of some high voltage lines were found with red (dead) needles and closer examination revealed dissection (drying out) due to electro-coupling.

Further research on high voltage (500 KV +) transmission lines may show even more adverse effects on vegetation, wildlife and man.

I would appreciate receiving the addendum and any other publications you have on the proposed Colstrip Units # 3 and # 4.

Sincerely,


Lee F. Werth

RECEIVED

OCT. 3, 1977

SEP 30 1977

THOMAS E. JUDGE
DIRECTOR

MDHES

Environmental Sciences Div.

STATE OF MONTANA

DEPARTMENT OF HIGHWAYS

HELENA, MONTANA 59601

H. J. ANDERSON
DIRECTOR OF HIGHWAYS

September 30, 1977

A REPLY REFER TO:

Colstrip 3 & 4

Thomas M. Ellerhoff
Environmental Sciences Division
Dept. of Health & Environmental Sciences
Board of Health Building
Helena, Montana 59601

Dear Mr. Ellerhoff:

In response to your September 13th letter we have made a rather cursory review of the preliminary and final environmental impact statements for Colstrip 3 & 4, the transmission lines, and associated facilities.

Our basic concerns at this time are essentially those expressed earlier. Namely, that the impacts to the transportation facilities be adequately evaluated and that the developer be responsible for actions to minimize the harmful impacts. Adequate roadways must be constructed prior to the construction of generating units and transmission lines in order to provide for traffic generated by the utility construction.

In the case of transmission lines, we are additionally concerned with problems of capacitive coupling, line clearances, and the aesthetics of lines which cross or parallel the highway facilities.

Of course we take the position that measures to mitigate impacts are front-end costs to the developer and are his responsibility to finance.

If you have any questions about our concerns or positions please call us.

SCK/DSJ/js

Very truly yours,

H. J. ANDERSON
DIRECTOR OF HIGHWAYS

By *Stephen C. Kologi*
Stephen C. Kologi, P. E., Chief
Preconstruction Bureau



DEPARTMENT OF BOTANY

(406) 243-5222

University of Montana
Missoula, Montana 59812

RECEIVED

SEP 30 1977

MDHES
Environmental Sciences Div.

September 29, 1977

Mr. Thomas M. Ellerhoff
Department of Health and
Environmental Sciences
Environmental Sciences Division
Board of Health Building
Helena, MT 59601

Dear Mr. Ellerhoff:

In regards to your request for my comments on the operating permit for Colstrip Units 3 and 4, the following are my feelings. Enclosed are two publications which relate directly to the environmental impact of the emissions of Colstrip Units 1 and 2 since they went into operation in 1975. You will find within this material that we predicted, prior to the operation of Units 1 and 2, the emissions of Colstrip Units 3 and 4 would have a measurable effect upon the ecosystems of that area. The data accumulated thus far show that this effect has occurred. We caution you on allowing for the construction of Units 3 and 4 which would triple the output of atmospheric pollutants.

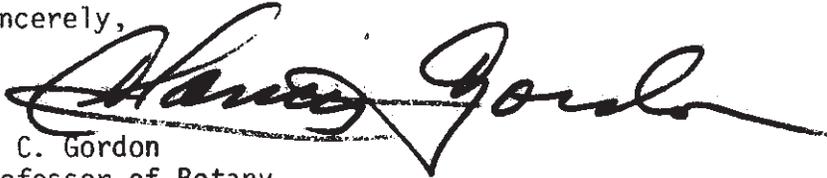
Since the amounts of these pollutants have a direct relationship to the abatement equipment installed, I believe that a review of all available literature concerning this subject (current pollution abatement equipment) is very apropos and necessary by the Department of Health and Environmental Sciences. Also, since it is the intent of both the EPA and, I assume, the State Board of Health to have installed the "state of the art" in pollution abatement equipment in all coal-fired power plants, it would seem to me that the Health Department's review of Colstrip Units 3 and 4 would include whether or not the power consortium is meeting this requirement.

It is my contention, as well as from the transcripts of the DNRC hearings, that the utility consortium has not purchased the "state of the art" abatement equipment but has purchased equipment that allows for meeting those state and federal ambient air standards which are totally inadequate

Mr. Thomas M. Ellerhoff
September 29, 1977
Page 2

to protect the pristine environment of southeastern Montana. However, knowing that the Air Quality Bureau as well as the Montana State Board of Health have continuously renege in their duties of protecting the citizens of Missoula, East Helena, Columbia Falls, Ramsay, Butte, Billings, and Anaconda, I find it surprising that they would now do much in protecting the ecosystems of southeastern Montana!

Sincerely,

A handwritten signature in black ink, appearing to read "C. C. Gordon". The signature is written in a cursive style with a large, sweeping flourish at the end.

C. C. Gordon
Professor of Botany

CCG/kb

cc: Ben Wake
Arthur Knight
Kit Johnson
Rita Sheehy
Sam Reynolds

605 E. Fairmount Avenue
State College, Pennsylvania 16801
27 September 1977

Thomas M. Ellerhoff
Environmental Sciences Div.
Dept. of Health and Environmental Sciences
Board of Health Building
Helena, Montana 59601

RECEIVED
SEP 30 1977
MDNES
Environmental Sciences Div.

Dear Tom:

Thank you for inviting my input into your addendum to the DNR Colstrip EIS. At this time, I find myself with too much to do and too little spare time - the life of a grad student! However, there are portions of that original document that have been out of date for some time (in terms of what has been learned since that writing). The most notable ~~of~~ portions of what I wrote that need updating relate to the sulfur in the coal. Obviously matters relating to the fuel and its sulfur are important to any discussion of air quality impacts or measures to prevent undue degradation of the air quality.

During the hearings (Board of Health hearing) much was learned about the manner in which the applicants treat this topic in the running of the plants. I sincerely believe I raised serious questions about the lack of knowledge concerning the hour by hour and day by day variations of sulfur being fed into the boilers. A little time spent reading the transcripts (if you can find the relevant portions) reveals how the company dealt with these questions. Instead of answering the questions with sound data or admitting the answers do not exist, they manufactured answers.

The best example of this kind of behavior concerned the coal pulverizers and their ability to remove sulfur (pyritic sulfur). Dan Berube was asked if the company had ever run tests to determine how much sulfur was actually removed by this method. He said, "no". Later as this point was raised again, the company witnesses (I think it was Berube himself at times) claimed that 50% of the pyritic sulfur was removed by the pulverizers. The pulverizers themselves became "pyrite rejection systems". One such pulverizer was so labeled on the tour taken by the Board of Health. By the time of the final arguments, it was stated that the pyritic sulfur of the coal was removed by the pulverizers.

Please do not take what I said in my testimony as my statement on the distribution of the sulfur in the seam of coal. I was trying to show how sulfur varies in coal and how it could be varying in the coal which will be put into the boilers of the Colstrip power plants during the next 30 years. Your addendum should include and get the idea across to the reader how we do not know the sulfur varies in that seam and that given the operation of the planned units, the sulfur in fuel regulation may be violated from time to time for short periods (generally). According to some investigators, these short duration pulses of SO_2 may cause more damage than lower levels for longer periods of time. I cannot comment on that topic or on how short increases of sulfur to the boiler affects air quality. However, since the company puts

great stock in their claim that the boilers (thus the scrubbers) will never see more than one percent sulfur in the coal, their manufactured answers to these important questions should be pointed out.

Gerald Mueller worked closely with me on this phase of the hearing and knows the subtleties of this area and he also knows where these issues are found in the record. I will send him a copy of this letter. If either you or he has any specific questions, I will be glad to help in any way I can - except write the material! HA

Thanks again for the opportunity to have some input and I hope this letter will be of some use.

Sincerely,



Lynn A. Brant

RECEIVED

SEP 28 1977

MDHES
Environmental Sciences Div.

September 26, 1977

M E M O R A N D U M

TO: Tom Ellerhoff, Technical Writer
Department of Health & Environmental Sciences

FROM: C. R. Draper, Administrator
Research & Information Systems

SUBJECT: Update and Revision, Colstrip 3 & 4 Economic Impact Statement

After our report on the economic impact of Colstrip 3 and 4 was submitted, there was a time lapse of several months before the DNR-Energy Planning Division report was published. During that time, updated information was used by DNR to revise and supplement our report.

In the past 3 years, many additional changes have of course taken place that would lead to a revision of project costs, property evaluation, and hence tax impact as well as local government costs associated with the development. In view of the fact, however, that the original study took a year and required a special grant to support the work, we don't feel we can re-do the study at short notice and without some special funding. The general conclusions as to the probable impact of this development have not changed significantly so far as we can tell -- although to be sure the scales on the charts and the numbers in the tables are in need of revision. But without some support funds and time to work it into our present schedule, it seems doubtful we could make the necessary changes.

CRD



INSTITUTE FOR SOCIAL RESEARCH

University of Montana

Missoula, Montana ~~59801~~ 59812

(406) 243-0211

September 20, 1977

RECEIVED

SEP 22 1977

**MDHES
Environmental Sciences Div.**

Mr. Thomas M. Ellerhoff
Department of Health and
Environmental Sciences
Board of Health Building
Helena, Montana 59601

Dear Tom:

In response to your letter dated September 13, 1977, let me say that I am keenly interested in updating the sociological information on Colstrip 3 and 4 which my ISR colleagues and I prepared three or four years ago under the auspices of DNR&C and NGPRP. However, it would take several months and about fifty thousand dollars to do this updating in a professionally and scientifically sound way. So geht es!

Good hearing from you. Best wishes.

Sincerely,

Raymond L. Gold
Director

RLG/jm

September 16, 1977

MEMORANDUM TO: Tom Ellerhoff
Department of Health
Helena

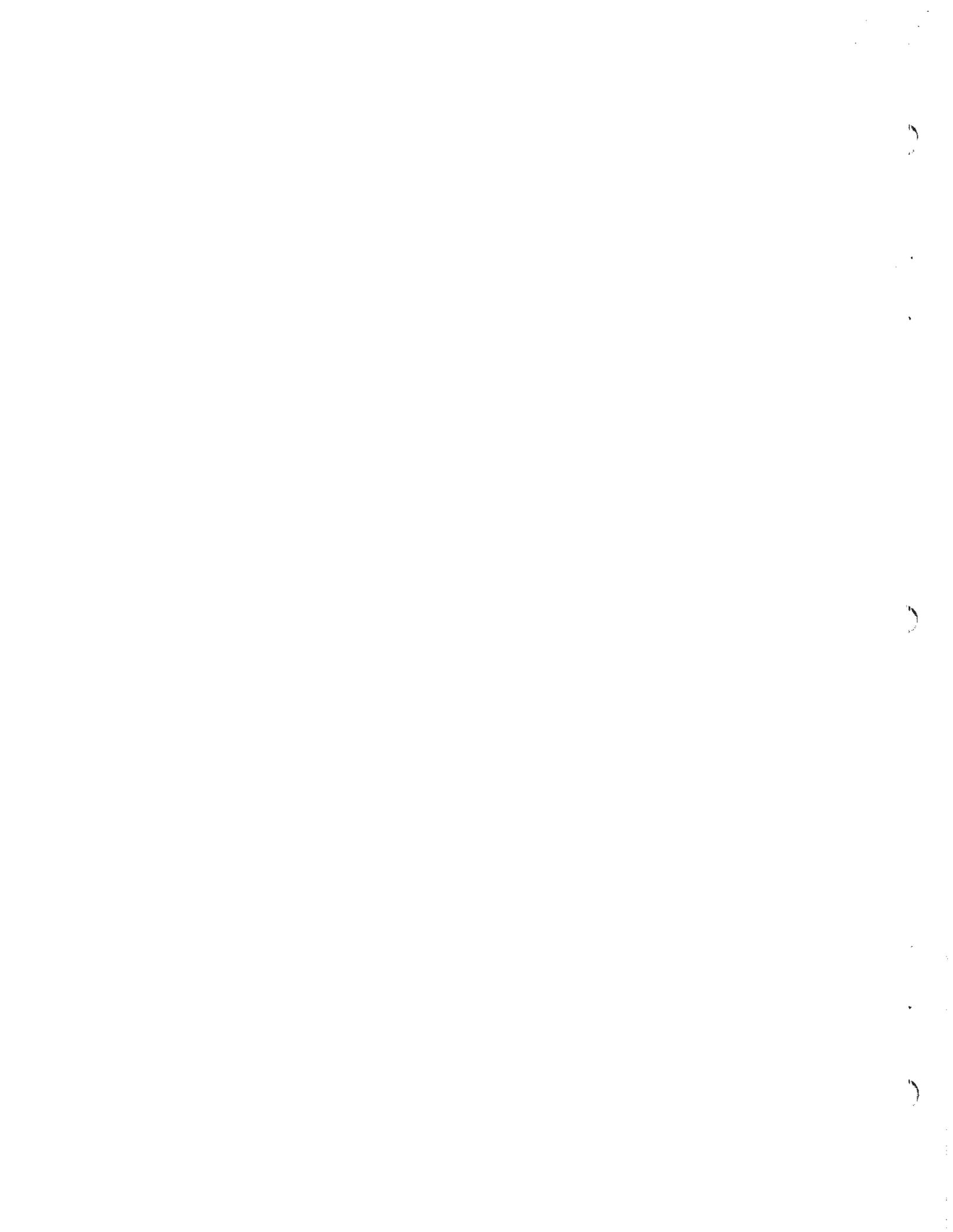
FROM : /s/ R. Mayer

SUBJECT : Colstrip

BLM has our files from our old study so we don't have our old information.

Certainly things have changed since we prepared the recreation material but we don't have the staff to update it. Possibly Poz can give it attention.

Thanks for the opportunity.



APPENDIX E





UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

September 27, 1977

OFFICE OF ENFORCEMENT

MEMORANDUM

SUBJECT: Interpretation of Offset Policy/Colstrip Units 3 and 4
FROM: Director, Division of Stationary Source Enforcement
TO: Charles Baldwin, Attorney
General Enforcement Section
Enforcement and Legal Support Branch (8E-EL)

This is in response to your memo dated September 7, 1977 concerning Colstrip Units 3 and 4 and their potential applicability to the December 21, 1976 Interpretative Ruling (IR).

My staff has been in contact with members of the Control Programs Development Division (CPDD) and the Office of General Counsel, and have determined that these two facilities are subject to the IR.

This decision is based primarily on the language in the IR, which states that a major source locating in the middle of an area that exceeds standards clearly will exacerbate the existing violation. It is the feeling of this office as well as CPDD that the language in the IR is valid, and that Colstrip Units 3 and 4 under worst case meteorological conditions will have an adverse impact on the area presently exceeding the national ambient air quality standards.

If you have any additional questions or comments, please contact Rich Biondi (755-2564) of my staff.

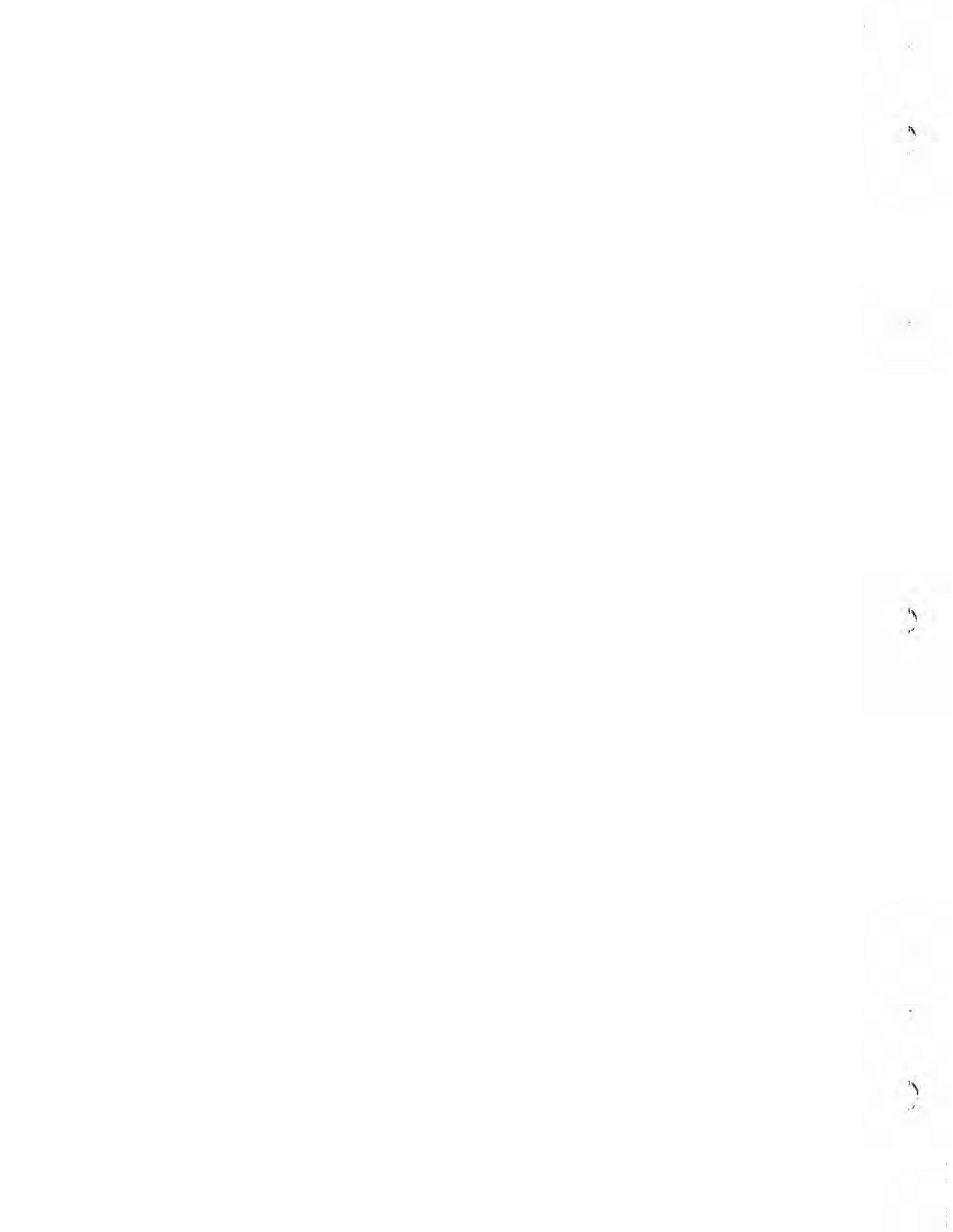
William F. Johnson
for Edward E. Reich

cc: Dick Rhoads - CPDD
Mike Trutna - CPDD
Dick Stoll - OGC



APPENDIX F

PROPOSED COMPLIANCE PLAN



COMPLIANCE PLAN FOR IMPLEMENTATION OF
AMBIENT PARTICULATE STANDARDS

The following are steps that have and will be taken in order to identify and mitigate sources which may now be causing high values of total suspended particulate (T.S.P.) matter measured at the Ambient Air Monitoring Site MP #3 at Colstrip. However, first, it is submitted that the operation of Colstrip Plants #3 and #4 will not contribute to the specific area where violations of the total suspended particulates have been noted.

Secondly, it is submitted that high values of total suspended particulates may well be caused by non-industrial or so called "fugitive dust" sources, and therefore are not to be considered violations. In the event that the high readings in the Colstrip area are from "fugitive dust", a new source, such as Colstrip 3 and 4, is allowed to construct without the need of complying with EPA's interpretive regulations regarding offsets, as discussed below.

Thirdly, it is submitted that an "existing" violation is considered to be at the proposed sources start up date. Therefore if the reviewing authority finds that the area will not be in violation at the source's start up date (September 1981 for Colstrip Units #3) a source such as Colstrip 3 and 4 could not exacerbate an "existing" violation, and therefore is allowed to construct without complying with EPA's offset regulations.

Fourth, it is submitted that the "source" as set forth in EPA's offset regulations refers only to the boilers as measured at the stacks of Colstrip units 3 and 4. Furthermore, upon the basis of the Board of Health hearings and findings of fact and conclusions of law regarding Colstrip 3 and 4, it is submitted that Colstrip 3 and 4 represents the lowest achievable admission rate for particulates.

Even in the event that the coal handling facilities for Colstrip units 3 and 4 are also considered a "source", as used in EPA's offset regulations, it is submitted that the existing coal handling facilities also represent the lowest achievable emission rate. Pursuant to EPA's notice of July 8, 1976, (41 Fed. Reg. 28002 et seq) the Federal Clean Air Act, as amended, 40 CFR 51.18 and EPA's interpretive ruling (41 Fed. Reg. 55524 et seq. Dec. 21, 1971) and the Montana State Implementation Plan -- steps being taken are: First, immediate steps are being taken to reduce the Total Suspended Particulates in the area, to obtain and offset from existing sources in the area greater than projected emission from Colstrip 3 and 4, so as to represent reasonable progress towards attainment of ambient particulate standards including:

1. A street sweeper has been purchased and the frequency of street cleaning is being increased and the areas being cleaned expanded.
2. Work is now under way to finish the landscaping immediately surrounding the plant administration building. The areas surrounding the service station and "snack shack" are scheduled to be paved by the end of August, 1977.
3. As soon as plans can be made, unstablized areas in the Colstrip town site under the control of the Montana Power Company or Western Energy Company, will be stablized with perennial vegetation.
4. The areas disturbed by mining will continue under the present program of reclamation as defined by State Law and conducted by Western Energy Company.
5. Annual vegetation existing in and around the town of Colstrip will be replaced with perennial cover where possible.
6. Owners of the property not belonging to either the Montana Power Company or to Western Energy Company are being contacted to determine their plans in correcting any unstablized surfaces under their control. It is our intention to offer assistance to these owners where needed and where practicable. (A major concern in this regard is the school where a large area surrounding recent construction and a large parking lot are both significant dust sources.)

7. Hardwood Lignin Liquor now at Colstrip will be diluted approximately 4.5 to 1 and applied to selected haul roads and accesses at the mine, to alleys and unpaved roads in the community of Colstrip. These applications are going to be evaluated as to the most efficient dilution factor, rate of application and frequency of application. Application will be made by large water carriers in the mine and by using the hydro seeder and a smaller truck around the community of Colstrip. Approximately 93,500 gallons of diluted lignin liquor are available on site for this preliminary evaluation.

In addition to these immediate mitigation measures which are being taken, the compliance plan also includes monitoring and scientific analysis. The Department of Health and the Montana Power Company are analyzing existing ambient air quality data and existing meteorological data. The Montana Power Company has retained Mr. Loren W. Crow, a consulting Meteorologist, (2422 South Downing Street, Denver, Co. 80210) to conduct this analysis. Mr. Crow's assignments are two-fold. First, Mr. Crow will look at the available data, i.e.; meteorological reports, suspended particulate data and recently compiled data on construction activity and surface conditions in the area of concern. From this evaluation a plan of immediate mitigation of apparent fugitive sources will be developed. Second, Mr. Crow will help prepare a long-term meteorological study to be used as an aid in policy decisions needed to achieve long-term air quality maintenance. Mr. Crow is also retained in a quality assurance position for both this long-term study and to overview our routine ambient monitoring program. We will continually analyze air quality and to determine causes of emissions. This will insure that we can change our on-going mitigated measures if necessary to effect compliance with the ambient particulate standards.



A P P E N D I X G

CONSTRUCTION PERMIT APPLICATION





THE MONTANA POWER COMPANY

GENERAL OFFICES: 40 EAST BROADWAY, BUTTE, MONTANA 59701 - TELEPHONE 406/723-5421

AUG 17 1977

LEGAL DEPARTMENT

MELVYN M. RYAN
VICE PRESIDENT AND GENERAL COUNSEL

JOHN CARL
JOHN W. ROSS
MARK A. CLARK
ROBERT P. GANNON
JAMES F. WALSH
JEFFREY W. SOGARD

AUG 17 1977
AIR MAIL
DEF. TELEPHONE

August 17, 1977

Montana Board of Health &
Environmental Sciences
Attn: John Bartlett
c/o Montana Foundation for
Medical Care
2700 Airport Way
Helena, Montana 59601

Department of Health &
Environmental Sciences
Attn: Michael D. Roach
Room 224
Cogswell Building
Helena, Montana 59601

Pursuant to the Board of Health's Certificate Condition No. 3 and the Department of Health's Order of July 19, 1977, the Montana Power Company, Puget Sound Power & Light Company, Portland General Electric Company, Washington Water Power Company and Pacific Power & Light Company (hereinafter called "Applicants"), hereby file with the Department of Health and Environmental Sciences of the State of Montana, an application for an Operating Permit pursuant to the Clean Air Act of Montana, RCM, 1947 as amended, §69-3911; and hereby reopen its prior application and submit supplemental information thereto in conjunction with a separate request, under express reservation of rights, for a Construction Permit.

Respectfully submitted,

APPLICANTS

BY: 

JR/jk
CC: Sandra Muckleson
Chief Legal Council

AUG 14 1977

SUPPLEMENTAL INFORMATION AND REOPENING OF APPLICATION

The Montana Power Company, Puget Sound Power & Light Company, Portland General Electric Company, Washington Water Power Company and Pacific Power & Light Company (hereinafter "Applicants") request the Department of Health and Environmental Sciences of the State of Montana to issue any Construction Permit which it deems necessary, on the basis of reopening their application of June 6, 1973 and supplemental information thereto, which is submitted herewith. That Application, was processed and acted upon pursuant to the Montana Clean Air Act as amended, RCM, 1947, §69-3911, the rules and regulations thereunder (MAC 16-2.14 (1) - S1400), and the Montana State Implementation Plan, as more particularly described in Exhibit "A" attached. That Application and the Board of Health's findings of facts are true and correct and complete information regarding the construction of Colstrip 3 & 4.

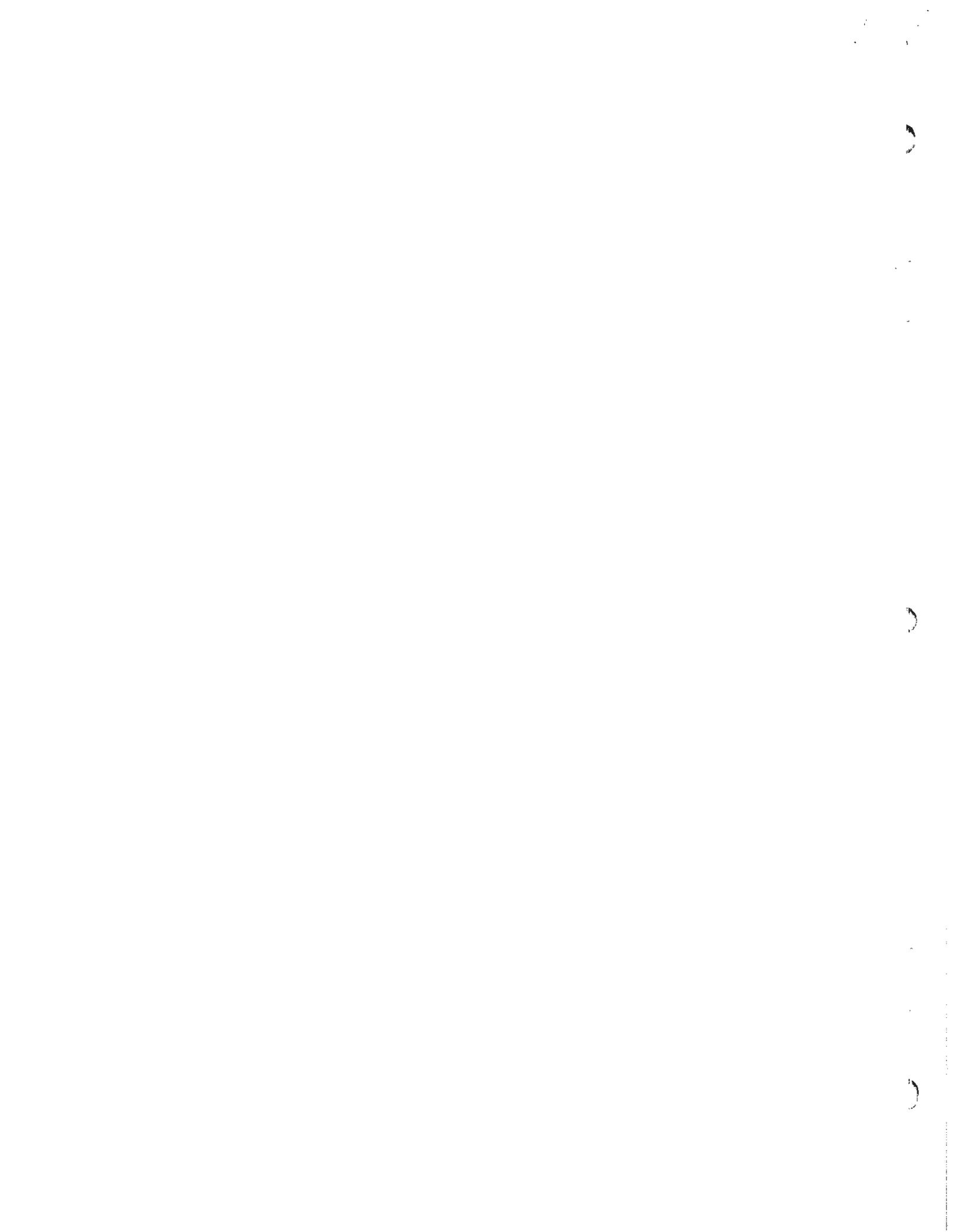
This supplemental information and request for a Construction Permit is made pursuant to the Montana Clean Air Act as amended, §69-3911, RCM, 1947, the rules and regulations thereunder (MAC 1602.14 (1) S1400), the Montana State Implementation Plan and the Federal Clean Air Act as amended, including but not limited to 40 CFR §51.18 and its interpretive rulings.

The reopening of the application and filing of this supplemental information and request for Construction Permit is made by the Applicants without in any manner waiving their rights as previously or hereinafter set forth, and is made only for the purpose of avoiding costly and time consuming litigation and to allow Applicants to implement the construction schedule of the plants in order to meet the energy needs of the Applicant's customers and minimize increased costs attended with any delay of construction. The Applicants reopening of their application and filing of this request is not at this time to be construed as a waiver by the Applicants that such a Construction Permit under the Montana Clean Air Act, or any other law, rule or regulation or order, is necessary in view of the Certificate of Environmental capability and public need, issued to the Applicants for the plants and associated facilities on July 22, 1976, by the Board of Natural Resources of the State of Montana under the Montana Utility Siting Act, which included the certification by the Montana Board of Health and Environmental Sciences. The Applicants specifically assert that all necessary construction permits have been obtained as required by law in the proceedings and hearings conducted by the Board of Health and the Board of Natural Resources, and as noticed according to law under the Clean Air Act of Montana and the rules and regulations of the Department as above noted and in which hearings the Department among others, including public parties, appeared and fully participated. Applicants further state that all requirements of §69-3911 (7), covering the compilation of an Environmental Impact Statement for a Construction permit, have been satisfied by existing Environmental Impact Statements and by the testimony and exhibits introduced in the hearings before the Board of Health and Environmental Science and the Board of Natural Resources, and the

subsequent findings of fact and conclusions of law, to which reference is hereby made as if fully incorporated herein. Submitted herewith as supplemental information is a fugitive Dust Abatement Compliance Plan, marked exhibit No. B, to correct total suspended particulates (TSP) violations. In addition thereto, Applicants contend that: (1) the operations of plants will not contribute to the area where the violations of (TSP) have been noted; (2) and the Dust Control Program will result in adequate emission offsets from present background of (TSP) when compared with the particulate emissions from the plants. Projected particulates emissions from Colstrip 3 and 4 (Applicants Board of Health hearing Exhibit no. 61), will be 2537.6 tons per year based on "worst" coal conditions (408 lb/hr) and based on "average" coal conditions will be 1915.6 tons per year (308lb/hr x 0.71 load factor x 2 units x ton/2000 lb x $\frac{8760 \text{ hr}}{\text{yr}}$). Projected offsets from other sources will exceed 2537.6 tons per year based upon the following corrective action, as set forth in "B" attached hereto entitled "Compliance Plan for Implementation of Ambient Particulate Standards."



filed a request to obtain a construction permit, and filed a separate application for an operating permit.



PROCESSING OF CONSTRUCTION PERMIT

The Montana Power Company, Puget Sound Power and Light Company, Portland General Electric Company, the Washington Water Power Company, and Pacific Power and Light Company ("Companies") doing business as utility companies, filed on June 6, 1973 an application for two 700 MW coal-fired steam electric generating plants to be constructed and operated at Colstrip, Montana. The Montana Department of Natural Resources and Conservation conducted a study of the Application and issued a Draft and Final Environmental Impact Statement (EIS). The Montana Department of Health and Environmental Sciences ("Department of Health"), pursuant to Sections 70-807(1) and 70-810(h) of the Montana Utility Siting Act ("Siting Act") and Section 69-3911 of the Clean Air Act and regulation thereunder studied the Application, and contributed to the EIS. The application sets forth the basic plans and specifications and other information regarding the proposed generating plant and its pollution control equipment, which application was reviewed and supplemented at the subsequent hearing, before The Montana Board of Health and Environmental Sciences ("Board of Health"). The Department of Health, on April 10, 1975, would not certify that the proposed facility would not violate state and federally established air quality standards, or any implementation plans. The Companies, among others, as parties adversely affected by the Department of Health action, requested a hearing before the Montana Board of Health and Environmental Sciences ("Board of Health"). Said hearing was granted, and duly noticed on May 2, 1975, pursuant to Section 69-3909, R.C.M. 1947, the Clean Air Act of

Montana, and Section 69-4808.2, R.C.M. 1947, the Water Pollution Control Act of Montana, as referenced in Section 70-810(1) (h) and 70-817, R.C.M. 1947, as amended, of the Siting Act.

The duly noticed hearing commenced on June 5, 1975, with the Department participating as a party. At the outset of the hearing the Hearing Examiner publicly announced that the hearing was "before the Board of Health and Environmental Sciences--on the federal and state established standards for air and water quality provided for in Title 69, Chapter 39 and Chapter 48 of the revised Codes of Montana, as amended, or rules promulgated thereunder in the implementation plan submitted therefor and whether the proposed facilities will violate any of the above-mentioned standards."

On November 21, 1975, the Board of Health issued its decision which set forth Findings of Fact, including a description and estimated cost of the pollution control equipment to be constructed at Colstrip, Montana, and including a Finding that the facility will comply with all applicable standards.

The Board of Health's decision also sets forth certain conditions, including Condition #3, which provides:

"The certification with conditions herein set forth does not constitute a waiver of any of the requirements of the Clean Air Act, Water Pollution Control Act or the implementation plan, including the necessity of obtaining a permit in accordance with the rules and regulations implemented under §69-3911, R.C.M.1947."

Pursuant to the Board of Health's Certificate Condition No. 3 and the Department of Health's Order of July 19, 1977, and having complied with all applicable provisions of the Montana Clean Air Act, and rules and regulations thereunder, as described above, the Companies, under reservation of rights, reopen their application and

APPENDIX H



APPENDIX H

Surveillance & Analysis Division, 1860 Lincoln St., Suite 103, Denver, CO 80295
 August 26, 1977

Observing NSPS Monitoring and Emissions Tests at Colstrip Units 1 & 2

John Floyd
 Air Surveillance Section
 Surveillance Branch (8S-S)

Bob Baldwin
 Enforcement Division (8E-EL)

MR	Rev	9/2
EG	mt.	7/13/77
EW	C.C.	9/2
HR		9/1/77

Purpose:

Colstrip Units 1 and 2 of the Montana Power Company (MPCO), located at Colstrip, Montana, required compliance testing for particulates, SO₂ and NO_x emissions according to sections 60.42, 60.43, and 60.44, respectively. Furthermore, both units must comply with all continuous emission monitoring requirements except for NO_x (see sec. 60.45(c)) under sections 60.13 and 60.45. I have visited the plant several times since February 28, 1977, in order to observe all the necessary testing. Below is a current status report on Colstrip, as well as an executive summary of past observations and tests.

Summary:

All testing at Colstrip was completed by Energy & Environmental Resource Consultants, Inc. (EERC) formerly Yaponcich, Sanderson, & Brown Laboratories of Billings, Montana. The vendor of the monitors, Environmental Data Corporation (EDC) was present during and responsible for all specification tests of the EDC monitors.

The particulate, SO₂, and NO_x emissions of Units 1 and 2 are within the NSPS emission limitations. The emissions in pounds per million BTU heat input (lbs./10⁶ BTU) for Units 1 and 2 by pollutant ^{are} shown in the table below:

Parameter	Test Results		NSPS Std.
	(#1)	(#2)	
Particulate	0.032	0.029	0.10
SO ₂	0.156	0.198	1.20
NO _x	0.286	0.378	0.70

These results are from tests conducted by EERC on May 9-11, 1977, and February 28-March 2, 1977, respectively, by unit. This testing was observed by EPA.

The specification testing of the monitors has taken longer. The original attempt was begun on June 21, 1977. During that week, the opacity, SO₂, and NO_x monitors of both units were tested according to EPA specifications 1 and 2 of Appendix B. Rough results indicate that Unit 2, SO₂

monitor does not perform with respect to the accuracy specification of Spec. 2. The NO_x monitor on Unit 2 failed its endurance test (168 hrs.) and no other tests could be completed. It has since been decided to exempt the NO_x monitors of both units from specification testing due to the "30% rule" of section 60.45(c). Unit 1, SO_2 and opacity, and Unit 2, opacity, should meet our specifications according to preliminary results. The CO_2 (diluent monitors) were not installed until approximately July 25, 1977. The Unit 1, CO_2 monitor is still not operative and is experiencing several start-up oriented problems. The Unit 2, CO_2 monitor began its specification testing on August 12, 1977. Those results are not expected until about October 12, 1977. I did not observe this testing. Unit 1, CO_2 is still not scheduled for certification. I do not plan to attend, but intend to review the original strip chart record of the tests on the monitor, as I will do in the case of Unit 2, CO_2 . I plan to attend the retesting of the Unit 2, SO_2 monitor when MPCO notifies us in writing of the scheduled date (hopefully, October 17).

In frequently observing the operation of the outlet monitors on Colstrip Units 1 and 2, I have noticed that these monitors vibrate on the stack much more than any of the other six (6) monitors we have observed in this region. Attempts have been made by EDC and MPCO to cope with this vibration which travels through the fans, foundation, duct work, and the stack liner to the monitor flanges and housings. Furthermore, excessive summer heat in the annular stack room where the monitors are located has necessitated that certain instrument parts, which are designed to be housed in the same box containing the monitor mechanisms, had to be relocated temporarily outside their normal housing in order to be cooled and not create excessive heat in the monitor housing, in order to be more certain that the monitor would operate properly. This was done during the monitor specification tests.

Between the vibration and the heat problems, these monitors have had a difficult time passing the EPA specifications. Under such conditions, an extractive-type monitor would likely operate much better.

MPCO has sent in the first quarterly excess emissions report as expected. This was a very general report. I am now preparing an example report for sources to use in preparing a more detailed and meaningful report. EPA should question (and inspect) the record and nature of the process upset conditions which excused virtually all the recorded excess emissions. I feel some of the excuses may not be allowable or would require more documentation.

The report of the July 21 monitor specification testing was received August 26, 1977, including all work except CO_2 monitors on both units and opacity of the Unit 2 SO_2 monitor. This will be reviewed as expeditiously as possible. The Unit 2 SO_2 monitor will be scheduled for retesting.

Conclusions:

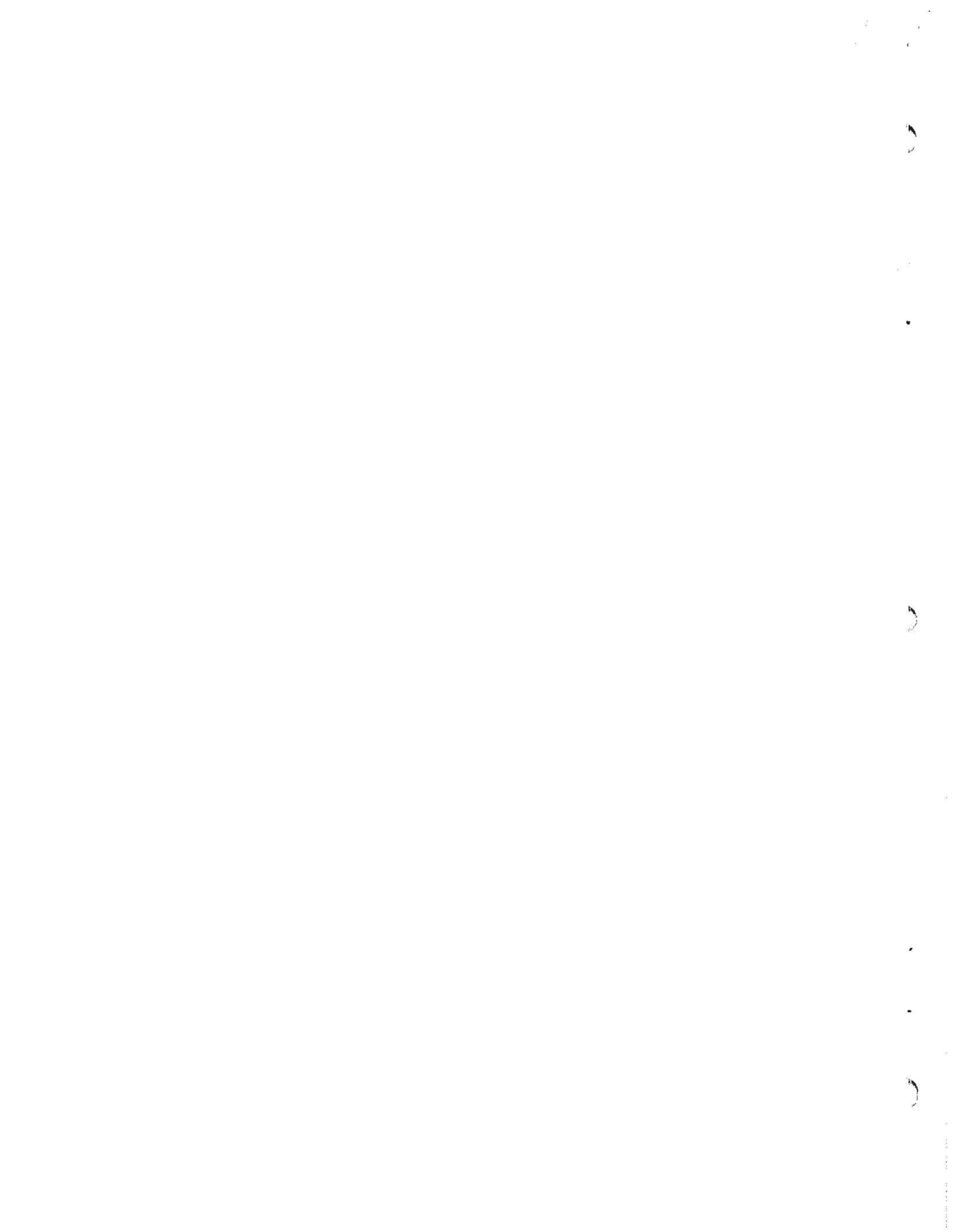
Colstrip Units 1 and 2 meet the emission limitations of 60.42, 60.43, and 60.44. The requirements of the emission monitoring regulations of 60.45 are partially completed, demonstrating only partial compliance, as all tests have not yet been completed. The remaining tests are being scheduled at the earliest date agreeable to MPO, EPA, and EERC. The monitors have frequent problems with reliability and continuous operation. We should have more frequent inspections of the facility to insure proper operation of the monitors, as well as on site audits of their files to maintain the integrity of the data. I understand MPO tentatively plans to purchase the same model of instruments for Units 3 and 4. Unless drastic stack and foundation modifications are planned (as discussed above), we may wish to require the installation of another type of monitoring system on these two new units, should they be built.

cc: Harry Keltz, Montana Bureau of Air Quality ✓
Norm Huey, ASHRAE (SAH-A)





A P P E N D I X I



APPENDIX I



THE MONTANA POWER COMPANY
 GENERAL OFFICES: 40 EAST BROADWAY, BUTTE, MONTANA 59701 - TELEPHONE 406/723-5421

REC.	ACT.	DATE
HK	REV	5/31
HR	MP	
HK	FILE	5/31

May 24, 1977

Mr. Michael D. Roach, Chief
 Air Quality Bureau
 Department of Health and
 Environmental Sciences
 Capitol Station
 Helena, MT 59601

Dear Mr. Roach:

RE: Colstrip Unit #1; Scrubber Maintenance

In response to the request for reports on certain types of maintenance, as outlined in your Mr. Keltz's letter of November 9, 1976, we would like to submit the following: On April 29, 1977, Colstrip Unit #1 annual overhaul was extended for maintenance on the scrubber wash tray pond return system. The spray nozzles that wash the underside of the mist eliminators were experiencing plugging on all three scrubber vessels. Research into the problem showed that the nozzles were partially filled with a material coming from the pond bank around the suction lines of the tray return header. Apparently, some of the bank was disturbed during routine clean out of the pond. To alleviate this problem a temporary 10-inch rubber lined pipe was routed from the wash tray pond to the wash tray pond return pumps with a floating pump in the pond. The new return system was successful in cleaning up the return water and thus eliminating the plugging. We may make these revisions permanent. On May 4 Unit #1 was brought back on line and subsequent EPA testing has shown the performance is still excellent. If you have any questions or comments, please contact us.

Very truly yours,

D T Berube by JMB

D. T. Berube
 Assistant Chief Engineer
 Generation

RECEIVED

MAY 27 1977

AIR QUALITY BUREAU
 DHE, TEMP. PERM.

WJM/kh/5:4

*cc: Dr. Knight
 Bd Members
 Faf Unit*



THE MONTANA POWER COMPANY
GENERAL OFFICES: 40 EAST BROADWAY, BUTTE, MONTANA 59701 - TELEPHONE 406/723-5421

May 24, 1977

RIE	ACT	
HK	RCV	5/31
MR	INT	
HIC		5/31

Mr. Michael D. Roach, Chief
Air Quality Bureau
Department of Health and
Environmental Sciences
Capitol Station
Helena, MT 59601

Dear Mr. Roach:

RE: Colstrip Unit #2; Scrubber Maintenance

In response to the request for reports on certain types of maintenance, as outlined in your Mr. Keltz's letter of November 9, 1976, we would like to submit the following: Colstrip Unit #2 was recently down for its annual overhaul and during the routine dye checking of the induced draft fan rotors, cracks were discovered on all three fan rotors on the center plates where the blades are welded to it. Experts from both Bechtel Power Corporation and Buffalo Forge Company were brought in to assess the situation. Preliminary findings indicate that the cracks were caused by metal fatigue. We see no indication that these cracks are in anyway related to scrubber technology and believe they would have occurred on these fans in any application. This kind of cracking has occasionally been found on large fans in other power plants in recent years and it is correctable. It has not affected scrubber performance.

All cracks were ground and welded under the direction of Buffalo Forge and Bechtel and Unit #2 is expected to return to service on the 19th of this month. We expect to work with the vendor on fan modifications to prevent this problem from reoccurring. If you have any questions or comments, please contact us.

Very truly yours,

D T Berube by JDB

D. T. Berube
Assistant Chief Engineer
Generation

RECEIVED

MAY 27 1977

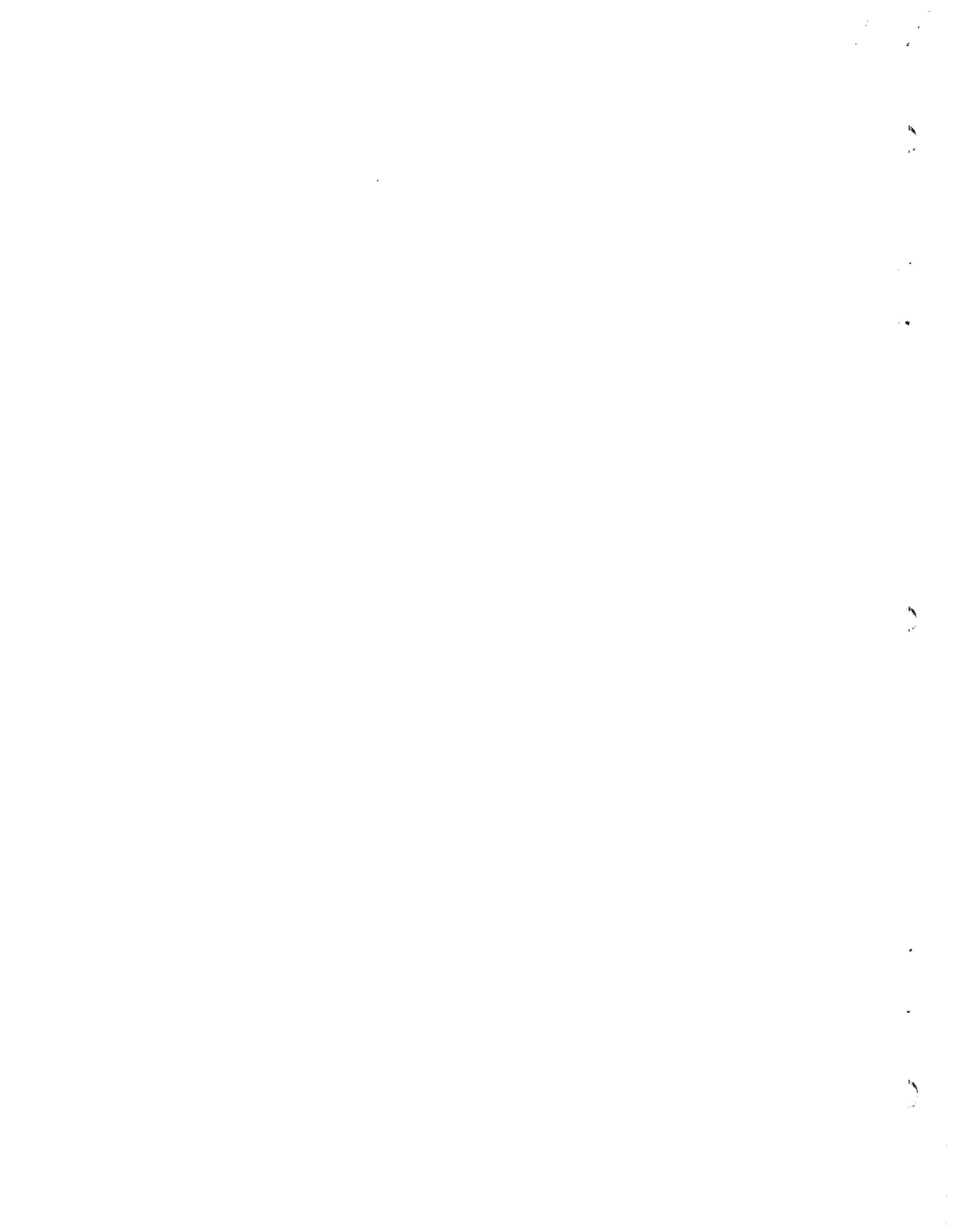
WJM/kh/5:3

ENCL 133
AIR QUALITY BUREAU
DNF. TEMP. PERM.

cc: Dr. Knight

APPENDIX J







APPENDIX J

Mr. Kelly

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION VIII
1860 LINCOLN STREET
DENVER, COLORADO 80203

REF.	DATE	BY
	9/20	RC
	9/21	C.C.

HJR
2/11/11
ENV

September 15, 1977

COLSTRIP 1 & 2

REF: 88-8

Mr. D. H. Sprague
Manager
Environmental Protection Department
The Montana Power Company
40 East Broadway
Butte, Montana 59701

Dear Mr. Sprague:

The emissions reports of performance testing done at your Colstrip Units 1 and 2 have been received, reviewed, and verified. The continuous monitors Quarterly Excess Emissions Report (QEER) for the second quarter of 1977, as well as the continuous emission monitors Specification Testing Report (STR), with strip charts, for the SO₂ and opacity monitors at Colstrip have been received. Although these two reports have not yet been reviewed or accepted, preliminary review indicates a few obvious areas for our concern which are discussed below.

Your performance tests under Section 60.8 on Unit 2 were completed on March 2, 1977. Under Section 60.13(e), you were to "conduct (complete) continuous monitoring system performance evaluations" on the Unit 2 system "within 30 days" of such performance tests under Section 60-8, or by April 1, 1977. You also were to "within 60 days thereof" submit two copies of those monitoring system performance evaluations (by May 31, 1977). We have been most lenient in allowing this schedule to be extended until August 26, 1977 when we received the two referenced evaluation reports.

This first QEER was general, as was expected since we did not furnish you with our recently developed standard QEER format. This standard format will be forwarded to you by September 30, 1977, and shall be used by you for your next QEER, which is due October 30, 1977; this QEER shall be reported in the units of the standard.

SEP 15 1977

The STR indicates that the Unit 2, SO₂ monitor does not meet the performance specification of 20% relative accuracy contained in Specification 2, Appendix B, Part 60. As Mr. John Floyd of this office told Mr. Myott of your staff while observing tests in July at Colstrip, EPA will allow MPCO to retest a monitor for those performance specifications which were not initially passed, providing MPCO submits to EPA in writing at least 10 working days in advance the date and time of that scheduled retest. In addition, you shall include in this notification to retest, the nature and extent of all modifications, and/or repairs done on this monitor since its original attempt to be certified. These changes are those which allow you to feel the monitor should be given a second chance to be certified, in light of the needed improvements. I understand from Mr. Myott that the retest of the Unit 2, SO₂ monitor will be done during the week of September 26, 1977, with the wet chemical testing (method 6) scheduled for September 29 and 30, 1977. We will have an observer present on September 29 and 30. You shall conduct the required tests on those two days.

I will forward to you by September 30, 1977, our review and response to this first STR, including any and all specifications to be retested on September 29, 1977, as well as the original certification charts.

You recall that nine repetitions of Method 6 will be necessary to comply with our requirements in Specification 2, Appendix B, Part 60. You should be aware that these nine repetitions shall be done according to Section 6.2.2.1 of Specification 2. Assuming the operational test period is begun on or before September 29, 1977, the STR for this SO₂ retest will be due by October 29, 1977.

Since the tests under Specification 3, Appendix B are relatively simple and can be recorded permanently on the 168-hour continuous chart record of the operational test period, EPA has agreed to allow the tests on the diluent (CO₂) monitors to be done at your convenience without our presence. We will accept the results of these Specification 3 tests, providing that the original continuous (uncut) strip chart records of the test results are submitted with the STR of these tests. These originals will be returned to you within 30 days of their receipt. A 15% CO₂ span check is fine with us for now, unless future performance indicates that a larger span value is needed to yield more reliable results. For the purposes of Section 6.2.3 of Specification 3, upscale points of stack CO₂ + 1% and 1.5% CO₂ will be acceptable. Be advised that since diluent monitor testing began on July 25, 1977 (even though Unit 1, CO₂ monitor was malfunctioning at that time), the STR for both diluent monitors (Units 1 and 2) is due by September 25, 1977. You may, however, wait on this report, and include it in the larger report due October 29, 1977.

I understand that the factory certification report which most closely represents the production lot of which your opacity monitors are a part, does not have the data in a reduced form. You are to submit this earliest factory report with the STR for EPA's review. You may also submit, for reference only, a factory report in which the data have been reduced. In the case of the diluent monitors, you shall submit the exact factory certification representing the exact lot of CO₂ instruments of which yours are a part.

Should you have any questions or cannot comply with this order to retest the SO₂ monitor on September 29, 1977, you are to respond to me or Mr. Floyd in writing by September 23, 1977.

Sincerely yours,

Charles A. Baldwin, Jr.
General Attorney
Enforcement Division

cc: Harry Keltz ✓
Montana Bureau of Air Quality

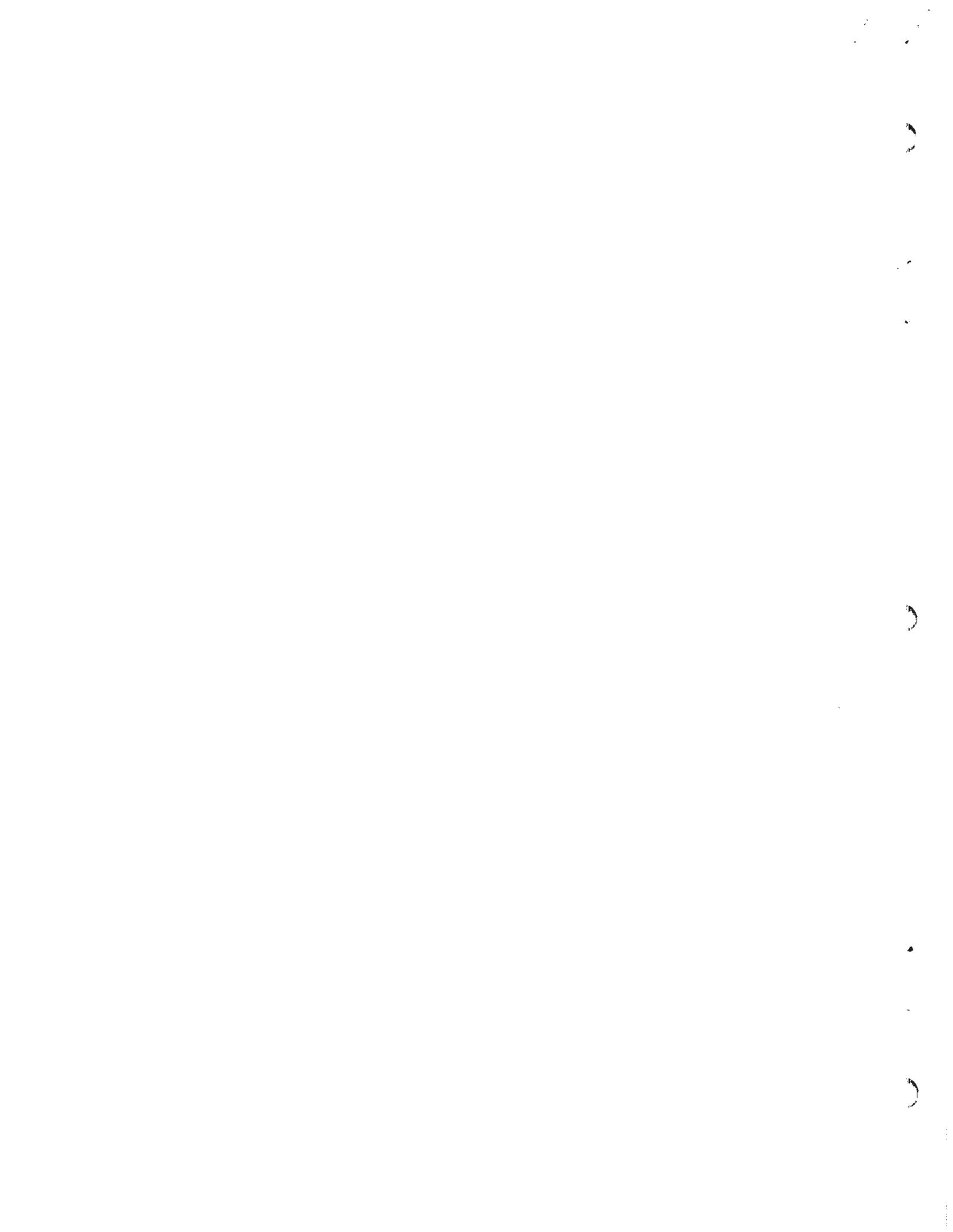
John Floyd BS-S

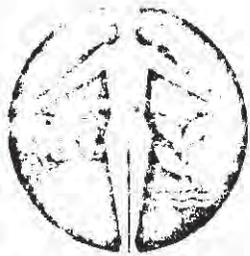




APPENDIX K







APPENDIX K
Department of Health and Environmental Sciences
STATE OF MONTANA HELENA, MONTANA 59601

AIR QUALITY BUREAU

~~John S. Anderson M.D.~~
~~XXXXXXXXXX~~
A. C. KNIGHT, M.D.
Director

MEMORANDUM

TO: Board of Health and Environmental Sciences
FROM: Harry Keltz, Engineer
SUBJECT: Colstrip Units 1 & 2, Monitoring Status
DATE: June 27, 1977

BACKGROUND

Colstrip Units 1 & 2 have been in commercial operation since October of 1975 and August of 1976, respectively.

The Department has been receiving monthly reports on Unit 1 since January of 1976 and Unit 2 since May of 1976.

Items covered in those monthly reports are as follows:

1. Gross and net kilowatts
2. Gross and net frequency distribution
3. Hours on line
4. Lime consumption
5. No. of scrubbers operating
6. Maximum, minimum and average pressure drop
7. Maximum, minimum and average scrubber slurry pH.
8. Coal consumption tons/month
9. Coal analysis, BTU's, ash, moisture and sulfur
10. ΔT across reheaters 50-75°F
11. ΔT across fans 15°F
12. Stack temperature

13. Scrubber availability
14. Stack monitoring data; opacity, NO_x and SO₂. Average and peak values are reports for each day of the month.

In addition, they are required to submit maintenance reports on certain items, if malfunction, upset conditions or maintenance of those items are of a nature which affects air pollution levels or the availability of the scrubbers.

The monthly report requirements have been amended to reflect certain changes which the Department felt were necessary. One of those changes is the inclusion of the inlet sulfur dioxide monitoring data for both plants. In addition, beginning with the July report, Montana Power Company will report nitrogen oxides (NO_x) and sulfur dioxide (SO₂) in both parts per million (ppm) and enforcement units (lbs/10⁶ BTU's).

Presently the Environmental Protection Agency has the test information necessary to certify Colstrip Units 1 & 2 as to whether or not they meet the performance criteria of applicable Federal Registers for mass emissions of sulfur dioxide, particulates and nitrogen oxides.

EPA personnel have not yet obtained the data necessary to certify the plants in compliance with applicable federal opacity standards via reference method 9. There is a possibility that this may be done by the State.

At this time the various monitors cannot be used to determine compliance status; that can only be done by source tests conducted according to the various Federal reference methods.

DISCUSSION

Coal Sampling

As indicated in previous information given by Montana Power Company and the Northern Plains Resource Council, coal sampling had not been performed on a daily basis. The integrated coal samplers began operation on or around April 19, 1977. Results of the few samples taken by the sampler, according to the April, 1977, Montana Power Company report, are not much different than the grab samples. For example, an average "as received" grab sample indicates that the coal has 0.693% sulfur, while the average of seven integrated samples is 0.691%. However, seven samples is too small a number on which to make any statistical evaluation; but if the trend continues as indicated, then there should be a clear indication of the sulfur content of the coal being fed to the pulverizer.

It is on an issue such as this that the inlet SO₂ monitor becomes important, since it will indicate the concentration of sulfur dioxide being introduced to the scrubber. Not all of the sulfur introduced to the boiler is converted to sulfur dioxide and the amount of conversion can vary. Montana

Power Company has made calculations indicating 95% of the input sulfur is converted to sulfur dioxide. According to other publications, the amount of sulfur to sulfur dioxide conversion is between 95% and 100% for coal-fired power plants.

Montana Power Company's testimony at the Colstrip 3 and 4 hearings indicated that the scrubbers would have to contend with 965 ppm (dry) of sulfur dioxide. This concentration, according to the testimony, corresponds to one (1%) percent inlet sulfur coal calculated on an "as received" basis. The 965 ppm (dry) SO₂ is equivalent to approximately 910 ppm (wet) which is what the inlet SO₂ monitor would read.

The Board of Health and Environmental Sciences in their conditional certification required:

"The applicant will utilize only coal from the Rosebud seam. It will at no time exceed 1% inlet sulfur content. Daily testing of the coal and sulfur content will be required to effect that control."

It is clear that this condition is for Colstrip Units 3 and 4 and does not apply to Units 1 and 2. However, clarification is needed from the Board on the meaning of "inlet sulfur." The Department believes it was intended to mean that sulfur content that would result in a 965 ppm (dry) or approximately 910 ppm (wet) sulfur dioxide concentration as seen by the inlet SO₂ monitor. The stated SO₂ concentration would have to be for the appropriate averaging period. For this reason, it is imperative that the inlet SO₂ monitors also be certified.

While there is a pyrite rejection system, this does not mean all pyritic material will be rejected at the pulverizer. If the pyritic sulfur in the coal cannot be pulverized to a small enough size, then it will be rejected. On the other hand, if it is crushable to the point where it can be air transported, it will be introduced to the boiler. Again, an accurate reliable SO₂ inlet monitor would indicate the concentration of SO₂ being fed to the scrubber and this could be correlated to input sulfur with some degree of accuracy.

Even though the integrated coal sampler began operation in April, it would appear that it is still being plagued with problems, according to the April monthly report. This also may have varying periods of inoperability until the bugs are worked out.

Regardless of the coal sampling and monitoring, the situation will always be what is happening to the coal after it is burned. The program as presently being carried out is not of the preventative type. It would be very difficult to require conversion to a preventative type of program on Colstrip Units 1 & 2 as far as inlet sulfur content goes. However, a preventative program could be utilized on Colstrip Units 3 & 4.

Since Rosebud coal from areas other than those now being mined may be fired in Units 3 and 4, the 1% "inlet sulfur" limitation could be exceeded. To prevent this, Montana Power Company and its partners should submit a "contingency plan" for pre-blending coal should the need arise. This plan should be a preventative type of plan.

Monitoring

Colstrip Units 1 and 2 presently have a total of eight (8) monitors each, six sulfur dioxide, one opacity, and one NO_x . One sulfur dioxide, one opacity and one NO_x monitor are presently located in the stack with three scrubber outlet SO_2 monitors and two inlet SO_2 monitors. The inlet SO_2 monitors are located on scrubber modules A & C in each plant.

Those monitors requiring Federal EPA certification are the stack monitors in each plant; i.e., opacity, sulfur dioxide and nitrogen oxides. However, in order to fully implement the Board's certification conditions for Colstrip Units 3 & 4, all monitors in both plants should be certified according to those procedures as outlined in the Federal Register dated October 6, 1975, and any subsequent amendments to those provisions or as approved by the Department.

Certification of the inlet SO_2 monitors is required to receive valid information regarding the 1% "inlet sulfur" condition of the certification.

The rationale behind having the scrubber SO_2 outlet monitors certified in addition to the stack SO_2 monitors is to ensure a steady flow of data should a malfunction befall the stack monitor(s). Since the average of the two outlet monitors must represent the stack concentrations, certification procedures will have to be worked out between the Department and Montana Power Company.

Certification test data and reports for the stack monitors must be submitted to EPA and the Department for certification. All other certification test data and reports for the other monitors (i.e., scrubber inlet and outlet SO_2 monitors) must be submitted only to the Department. Certification tests are complicated and the reports required are substantial. After the reports are submitted, significant time will be required by the Department and EPA for review. Preliminary indications are that it will take one to two months to compile the report once the data has been obtained. No estimates are available for review time. Another item to be considered is that if present monitors are to be replaced, such replacement would take a minimum of seven to eight months and could easily take a year after purchase before final certification tests were run.

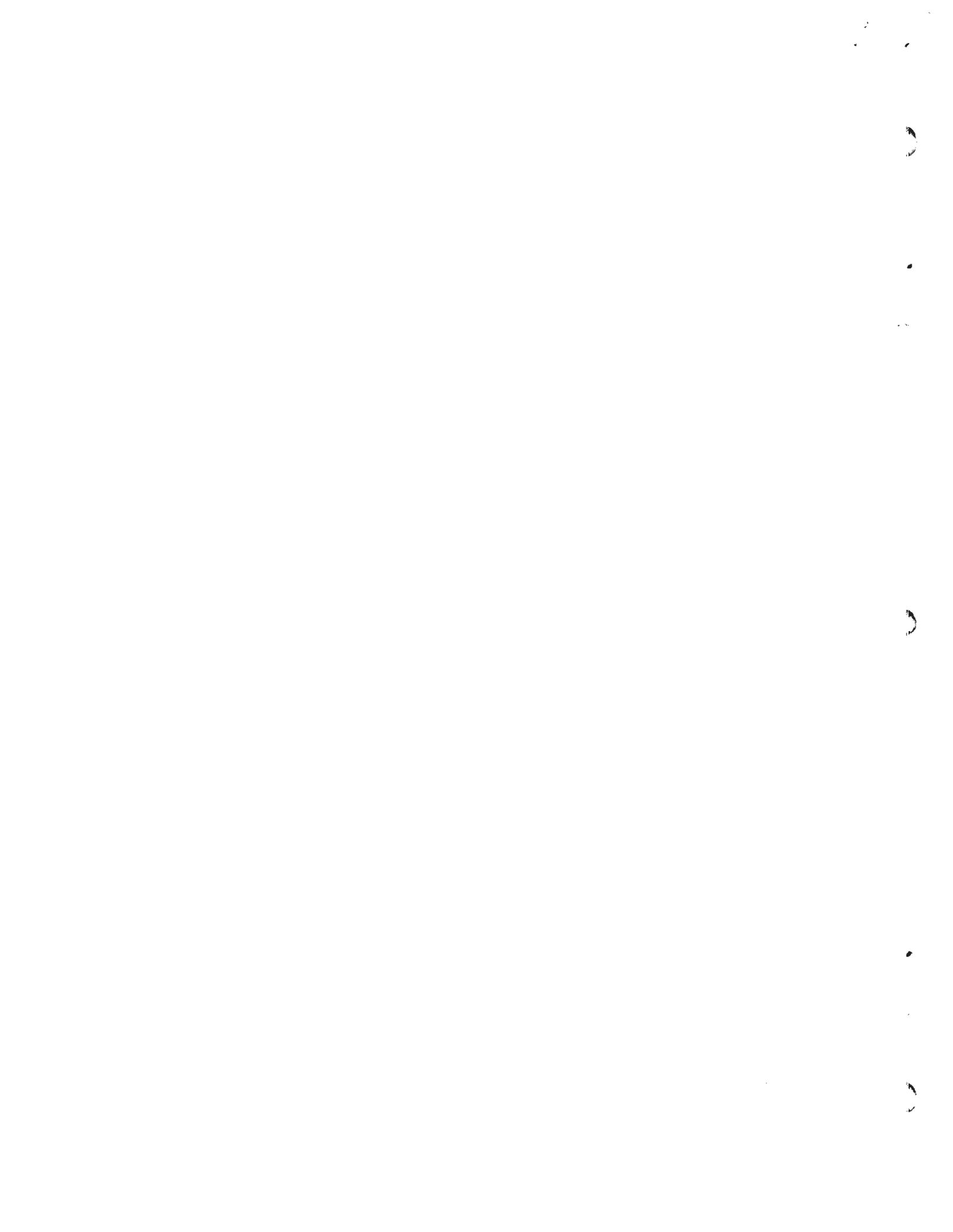
According to information submitted by Montana Power to the Board, data obtained by the monitors is useful; however, the Board and the Department must have data that is accurate and reliable. It is essential that all of the monitors be certified.

April monitoring, which is the latest month we have available, indicates that Montana Power Company is still having monitor problems. However, this past week they have attempted to obtain the necessary certification test data on the stack monitors. Compilation of this data will take some time before it is known whether or not the instruments can be certified.

RECOMMENDATIONS

The Department proposes that in order to clarify "inlet sulfur" and assure that accurate, timely and reliable data is obtained from Colstrip Units 1 & 2 monitors, that the Board adopt the following recommendations:

1. That "inlet sulfur" means that sulfur content of the coal fired that will not exceed a sulfur dioxide concentration of 965 ppm (dry) or 910 ppm (wet) at the inlet monitor when averaged over one (1) hour.
2. That Montana Power Company be required to perform certification testing in accordance with federal guidelines on the stack monitors and submit applicable reports to EPA and the Department no later than August 25, 1977, for certification.
3. That Montana Power Company be required to perform certification testing in accordance with approved guidelines on all other monitors (i.e. scrubber inlet and outlet SO₂) no later than August 15, 1977, and submit applicable reports to the Department for certification no later than September 30, 1977.
4. In the event that any of the monitors fail certification, that Montana Power Company be required to submit to the Department within 30 days after notification of certification failure an alternative plan which includes either:
 - (1) technical evidence that the certification failure is correctable (i.e., component failure and not an inherent defect in engineering design), or
 - (2) purchase new monitors where necessary. If such purchase is necessary Montana Power Company will expedite the acquisition, installation and certification of such monitors.
5. That Montana Power Company submit to the Department a contingency plan for pre-blending coal should the need arise for Colstrip Units 3 & 4 no later than December 31, 1977.



A P P E N D I X L



STACK MONITORS

Unit #1	Opacity	Sulfur Dioxide	Nitrogen Oxide	Carbon Dioxide
calibration error	x	x	x	
reponse time	x	x	x	
2 hr tests	x	x	x	
24 hr tests	x	x	x	
accuracy testing	x	x	x	

Unit #2	Opacity	Sulfur Dioxide	Nitrogen Oxide	Carbon Dioxide
calibration error	x	x	x	x
response time	x	x	x	x
2 hr tests	x	x	x	x
24 hr tests	x	x	x	x
accuracy tests	x	x (failed)	x	x

SCRUBBER MONITORS (SO₂)

Unit #1	A inlet	C inlet	A outlet	B outlet	C outlet
calibration error	x	x			
response time	x	x			
2 hr tests	x	-		-	
24 hr tests	x	x			
accuracy tests	x	x			

Unit #2	A inlet	C inlet	A outlet	B outlet	C outlet
calibration error	x	x	x		x
response time	x	x	x		
2 hr tests	x	-	x	-	x
24 hr tests	x	x	x	x	
accuracy testing	x		x	x	x

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THE MONTANA POWER COMPANY
 GENERAL OFFICES: 40 EAST BROADWAY, BUTTE, MONTANA 59701. TELEPHONE 406/723-5111

REC.	A.T.	30.
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September 28, 1977

Mr. M. D. Roach, Chief
 Air Quality Bureau
 Department of Health and
 Environmental Sciences
 Capitol Station
 Helena, MT 59601

Dear Mr. Roach:

RE: Colstrip Monitor Certification - 1st Update

A letter was sent to you on September 2, 1977, which outlined our progress to that date on the field work required for certification of the emission monitors at Colstrip. Since that time, additional field work has been completed which is detailed in this transmittal. Table 1 shows work completed as of September 23, 1977.

Table 1 - Colstrip Monitor Certification - Progress Report (9/25/77)

STACK MONITORS

x represents completed test, 0 represents incompletd test.

Unit #1	Opacity	Sulfur Dioxide	Nitrogen Oxide	Carbon Dioxide
calibration error	x	x	x	0
reponse time	x	x	x	0
2 hr tests	x	x	x	x
24 hr tests	x	x	x	x
accuracy testing	x	x	x	x
Unit #2	Opacity	Sulfur Dioxide	Nitrogen Oxide	Carbon Dioxide
calibration error	x	x	x	x
response time	x	x	x	x
2 hr tests	x	x	x	x
24 hr tests	x	x	x	x
accuracy tests	x	x	x	x

SEP 29 1977

THE MONTANA POWER COMPANY
 AIR QUALITY

SCRUBBER MONITORS (SO₂)

NOTE: This portion of certification is not required under N.S.P.S. regulation.

Unit #1	A inlet	C inlet	A outlet	B outlet	C outlet
Calibration error	x	x	0	0	x
Response time	x	x	0	0	x
1 hr tests	x	N/A	0	N/A	x
4 hr tests	x	x	0	0	x
Accuracy tests	x	x	0	0	x

Unit #2	A inlet	C inlet	A outlet	B outlet	C outlet
Calibration error	x	x	x	0	x
Response time	x	x	x	0	0
1 hr tests	x	N/A	x	N/A	x
4 hr tests	x	x	x	x	0
Accuracy testing	x	x	x	x	x

The only remaining required stack monitor tests are the calibration error and response time tests of the Unit #1 carbon dioxide monitor. Completion of these tests requires that Unit #1 be off line. Mr. Floyd of the EPA stated, in a telephone conversation with our D. Myott in September of 1977, that we could submit these tests at our convenience. Our intention is to do these tests as soon as Unit #1 has a scheduled outage of sufficient duration.

All of the field work necessary for certification of the inlet sulfur dioxide monitors has been completed. Some difficulty has been encountered with the field work required on the outlet sulfur dioxide monitors.

As you know, these outlet monitors are located on the scrubber outlet ducts upstream from where the ducts empty into the stack. Due to the nearby induced draft fans, the monitors were subjected to excessive vibration. As soon as the problem was traced to vibration, Bechtel, our major contractor, began a program to reduce this vibration. To date, they have been only partially successful in this program to reduce the observed vibration. A complex spring loaded assembly has reduced the vibration noticeably but additional changes appear to be required.

We have been unable to do the field work on the 1A outlet SO₂ monitor because of its location in the scrubber duct. In order to correct its vibration problem, a flange must be removed from inside the duct. Normally, this would not create a problem because the monitors were designed to be located on the scrubber side of the guillotine outlet damper. It was necessary, however, to move the monitor on 1A farther

Mr. M. D. Roach
Page 3
September 28, 1977

downstream during construction of the plant. Thus, in order to remove the flanges, a plant outage of some duration (1-2 days) is required. Our intention is to do this work when Unit #1 has a scheduled outage of sufficient duration.

A vibration problem on the 1B and 2B outlet SO₂ monitors has precluded the completion of the calibration error and response time tests on these two monitors. Bechtel is working diligently on this problem and has ordered additional materials (springs, etc.) to completely isolate these monitors. The 1B outlet SO₂ monitor has completed seven accuracy tests but still requires two additional tests to meet all the requirements of the specifications.

The reports required for these monitor certifications will be submitted to the Department of Health and Environmental Sciences by October 15, 1977, with the possible exceptions noted above. The Montana Power Company will make every effort to complete the remaining tests as rapidly as possible.

Very truly yours,



D. M. Sprague, Manager
Environmental Protection
Department

DMS/cay/A:7



REFERENCES

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- Department of Health and Environmental Sciences, Source Tests, February 1976.
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- Montana Power Co., letter to C. Greene, Department of Natural Resources and Conservation, May 20, 1975.
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CONTRIBUTORS

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