Chapter 38 Addendum

Litigation and the end game

On April 6, 1979, the defendants in the federal air pollution lawsuit presented a preliminary list of defense experts if the case went to trial. They included Leonard Weinstein, D.C. McCune, Jay Jacobson, Richard Mandel and David MacLean, all of the Boyce Thompson Institute; entomologist George Edmunds and plant pathologist Michael Treshow, from the University of Utah; and veterinarian William Harris, from Puyallup, Wash. Among the experts who provided data for the interrogatories were John Suttie, from the University of Wisconsin, botanist Michael Britton, from Kalispell, and veterinarian Fowler Young, of Whitefish, Mont. [1] On Aug. 3, the plaintiffs presented a preliminary list of defense investigators and experts if the case went to trial. They included plant pathologist Clint Carlson, entomologist Jerald Dewey, Mark McGregor, Wayne Bousfield, David McAllister and Cynthia McAllister, for the Forest Service.; R. Dwyer, Bernard Kostelnik, R.A. Hawk, C.E. Taylor and W.W. Smith, for the Anaconda Company; University of Montana botany professor Clancy Gordon, for the Environmental Protection Agency; Clint Carlson, William Clark, Cindy Williams, David McAllister, Arthur Sedlack, Jimmie Peterson, Dan Taylor, Robert Hall and Clyde Fauley, for Glacier National Park; and Kirk Foster, George Cleeves, Ibrahim Hindawi, Norman Huey, for the EPA; and L.V. Yerion, R.W. Gerstle and others from PEDCO Environmental Inc., of Cincinnati. [2] PEDCO had offered its services to the EPA for the federal lawsuit in May 1979. PEDCO's 591 employees would provide technical expertise on the control of fluoride emissions, provide background information on production processes and pollution control equipment, set up and maintain ambient air quality monitoring stations, investigate possible improvement methods for emission control, determine the costs for new equipment, and determine other effects caused by fluoride emissions. PEDCO had worked in the past for the federal government, including cases involving smelters. [3]

The plaintiffs responded to the defendants' first set of interrogatories on Aug. 3, 1979. The plaintiffs stated that the "value" of Glacier National Park was based in part on mineral permits, land trades, commercial concessions around Lake McDonald, real estate appraisals, and physical improvements such as buildings, among other things. The "value" of the Flathead National Forest was based in part on forest thinning and tree planting projects. The defendants asked for a detailed inventory of standing timber in the Flathead Forest by species, breast-height diameter, number, age and volume in board-feet. The defendants wanted a similar listing for other vegetation in the Flathead Forest. For wildlife impacts, the defendants wanted to know the species, number, age at death, and the specific biological, physical and/or chemical mechanism, process or reaction that caused injury or death. The defendants also wanted a dollar figure placed on all injuries or losses. The agencies said they were still developing answers, but Flathead National Forest Supervisor John Emerson and Glacier National Park Superintendent Phillip Iverson also responded by referring to the federal Multiple Use Act, claiming losses to aesthetic, recreational, grazing, wildlife, water, scenery, natural and historic objects, and other intangible uses. The plaintiffs also wanted to know the Forest Service's plans for the Flathead Forest, including details on Forest-wide plans and individual timber sales. The plaintiffs provided a detailed list

of forest fires in the Flathead Forest and Glacier Park from 1954 through 1978, from the very smallest to large fires, and included information on causes and how management addressed the fires. The defendants also wanted to know about use of fertilizers, pesticides and other chemicals on the Flathead Forest and Glacier Park. [4]

The discovery process paused in July 1979 when Anaconda attorney James Robischon agreed to let the plaintiffs' representatives enter the aluminum plant to inspect, photograph, examine, test and sample fluoride emissions, but he objected to allowing them to do the same for the new fluoride emissions control equipment. He cited confidentiality agreements made between the Anaconda Aluminum Co. and the Sumitomo Chemical Co. and Alcoa. Robischon made the same response for records kept at the plant. [5] Four days later, Robischon provided U.S. Attorney for the District of Montana Robert O'Leary with a sample confidentiality agreement based on an agreement made between Martin Marietta Aluminum Inc. and PEDCO for an air pollution case involving the aluminum plant at The Dalles, Ore. [6] On Aug. 25, U.S. Judge Russell E. Smith granted the plaintiffs' motion compelling discovery and ordered all non-attorney representatives for the plaintiffs to fill out and sign a confidentiality agreement. [7]

Through the discovery process, the plaintiffs obtained various statements and figures indicating that AAC staff and management were aware of potential air pollution problems at the Columbia Falls smelter. One set of data that came from AAC showed fluoride emission levels from 1970 through 1978 averaged over the year. They included 4,611 pounds in 1970; 2,606 pounds in 1971; 2,704 pounds in 1972; 1,722 pounds in 1973 while the plant was under partial production curtailment; 2,936 pounds in 1974; 1,371 pounds in 1975 under partial curtailment; 2,571 pounds in 1976; 2,934 pounds in 1977 while some reduction pots were not operating during the Sumitomo conversion; and 4,241 pounds in 1978 during the Sumitomo conversion. [8]

At the time of the lawsuit, the Montana state emission limit for the AAC plant at full production was 864 pounds per day, and the plaintiffs were seeking a lower limit of 200 pounds per day. The high figure for 1978 was later blamed on problems encountered with the new Sumitomo pots that was studied and remedied. "It may be noted that the Anaconda Company was aware of these emissions and of the fact that these emissions were settling on property within the boundary of Glacier National Park," Ezra Rosenberg, the Assistant Attorney General for the Land and Natural Resources Division, wrote on Dec. 17, 1979. Attached to Rosenberg's brief were additional documents supporting his claim, including a letter from 1971 in which AAC Assistant Manager Charles Taylor wrote to Glacier Park Superintendent William Briggle about establishing an air monitoring station in the Park. "We hope to document in 1971's reading the favorable results we expect from installation of our present scrubber upgrade program," Taylor said, referring to improvements being made at the time to the 15-year-old wet scrubber system. Rosenberg also attached copies of special-use permits issued by Glacier Park that allowed AAC to operate an air quality monitoring station in the park. [9]

A pre-trial hearing was held before Judge Smith in the federal courthouse in Missoula on Aug. 29, 1979. Attorneys for the defendants included James Robischon, Frederik Yerke, William Jones, John Neupert and Krest Cyr. Attorneys for the plaintiffs included Robert O'Leary, Steve Herman and Ezra Rosenberg. The defendants questioned the plaintiffs' legislative or statutory authority to bring the complaint, the

plaintiffs' legal right to injunctive relief, whether the matter should be deferred to the Montana Board of Health and Environmental Sciences, and whether ARCO and the Anaconda Company should be held liable separately. Neupert began by questioning the plaintiffs' right to injunctive relief, which if granted could mean shutting down the aluminum plant to stop the fluoride emissions. Neupert noted that the U.S. owned the property allegedly being damaged while at the same time was limited under the federal Clean Air Act as a sovereign entity. He also noted that fluoride emissions by the AAC plant were allowed under law because of the variance issued by the state government. He acknowledged that the variance had technically expired on June 30, 1979, but he expected that following negotiations the variance "likely" would be extended for another period and be made retroactive to June 30. [10]

Neupert also noted that the federal Clean Air Act regulated fluoride emissions for new plants, while the Montana Clean Air Act regulated fluoride emissions from existing plants. In 1976, the EPA adopted a fluoride emission standard of 2 pounds per day per ton of aluminum produced, which worked out to 1,000 pounds per day for the AAC plant at full production. The state regulation worked out to 864 pounds per day at the AAC plant. In the case being argued in court, the plaintiffs wanted to limit the AAC plant to 200 pounds per day, but the AAC plant was an "existing" plant and not a "new" plant, so the responsibility for establishing an emission control plan should fall on the state, Neupert said. He noted that the state had not yet established an emission plan for the AAC plant, and the plan would need to be approved by the EPA. Federal and state laws recognized the need to provide more flexibility to the states because of the difficulties facing existing plants in adapting the best available technology for emission control, he explained. Neupert also noted that the EPA had determined that fluoride emissions were not a "health" pollutant and were instead a "welfare" pollutant. [11]

Neupert also noted that the development of an emission control plan for the AAC plant would undergo a public process, which injunctive relief would bypass if granted. He explained that in 1977, "Congress adopted legislation that significantly curbed and intentionally curbed the powers of the federal land managers," referring to the Interior and Agriculture secretaries who had brought the case at hand. "It specifically curbed their authority to control air quality over federal lands," Neupert said. Congress had rejected prior law that had allowed the Interior and Agriculture secretaries to override state decisions, Neupert said, which was understandable considering the large amount of land held by the federal government – including about 30% of the land in Montana. Decisions made to protect federal land could spill over onto private land, he said. More specific to the case at hand, Neupert noted that the plaintiffs had argued that the U.S. was allowed to bring the complaint under Section 304 of the federal Clean Air Act, but that section merely provided legislative history to preserve common law remedies for a "person." The federal Clean Air Act at the time of its passage, however, did not include the U.S. under the definition of a "person." The definition later was expanded to include the U.S., Neupert acknowledged, but that was done so the EPA could sue the U.S. when the federal government did not follow its own air pollution laws. When Judge Smith asked if the expansion of the definition of "person" would apply to all purposes of the act, Neupert said no because the change would affect other parts of the federal Clean Air Act – especially the division of responsibility between the EPA and the states. [12]

Neupert noted that the Montana Supreme Court had refused to issue injunctive relief in the case of Dutton v. Rocky Mountain Phosphates, a fluoride emissions case in Garrison, Mont., because the high

court didn't want to issue an order that was more stringent than the conditions imposed by the Montana Board of Health. Neupert also noted that the plaintiffs wanted to use a portion of the Montana Clean Air Act in its arguments, but the state law had a provision which stated that the Act did not otherwise limit, abridge or impair substantive rights under common law. The Montana Clean Air Act contained a provision for variances, Neupert noted, while the Montana Water Quality Act had different language on this matter. Neupert asked the court to dismiss the complaint or strike any portions referring to injunctive relief. [13]

Robischon spoke next for the defendants by drawing a distinction between pre-emption by Congressional act and recognized administrative law and jurisdiction, a distinction he acknowledged was narrowing over time. The plaintiffs said they were not imposing a new fluoride emission standard on the AAC plant, but state law limited the AAC plant to 864 pounds per day and the plaintiffs wanted to limit the plant to 200 pounds. Robischon asked the judge to defer jurisdiction of the matter to the appropriate administrative agencies, including the EPA. As for the matter of injunctive relief, Robischon noted that the matter should be handled as a public process under the National Environmental Protection Act (NEPA) or the Montana Environmental Protection Act (MEPA). By following a public process under those acts, affected persons would have a chance to have their say in the matter. He asked the court not to circumvent that process because such a ruling would disrupt the uniformity of air pollution regulation by leading to the creation of numerous standards. Robischon said it was the responsibility of the Montana Board of Health to regulate fluoride emissions and not the U.S., which wanted the AAC plant's emissions limited to 200 pounds per day regardless of whether evidence existed that damage to vegetation and wildlife had been caused by fluoride from the plant. It was the responsibility of the Montana Board of Health under authority granted to it by law to balance the priorities of its citizens through the legislative processes, Robischon said. [14]

Judge Smith responded by disagreeing – the case did not involve setting a new fluoride emission standard, the emissions were simply too high. Smith acknowledged that a ruling in favor of the plaintiffs would create some interference with state law and state process, but in the case at hand the emissions were harmful. Robischon responded by noting that granting injunctive relief would establish a "watershed" precedent. He said he had searched in vain for cases that would allow such pre-emption. Yerke spoke next for the defendants, noting that when the complaint was first filed, it was U.S. v. ARCO, but the amended complaint added the Anaconda Company. He explained that under the six-year statute of limitations in the matter, the complaint related to the period from 1972 through 1978, during which time the smelter changed owners. He characterized information provided by the plaintiffs to describe ownership of the plant as "loose language." Yerke also asked Judge Smith to strike the reference to "wildlife" in the case before the court. [15]

Yerke also addressed the issue of treble damages sought by the plaintiffs under an old state timber trespass law that had similar language to statutes found in states across the West. He then described the outcome in a number of fluoride emission cases filed in Oregon and Washington where the plaintiffs had sought injunctive relief. 1) In the unpublished case McCallister et.al. v. Reynolds Metals Co. decided in 1952, U.S. Judge James Fee ruled that the treble damages statute was never meant to apply in a situation like the one before him. 2) In Thorup v. Reynolds Metals Co. also decided in 1952, Judge Fee

again ruled that the statute did not apply. 3) In Arvidson v. Reynolds Metals Co., a case involving 18 agricultural operations that was decided in 1953, U.S. Judge George Boldt ruled that neither the Oregon or Washington statutes applied. The case was affirmed by the Ninth Circuit Court of Appeals and denied by the U.S. Supreme Court. 4) In Fairview Farms Inc. v. U.S. decided in 1956, U.S. Judge William East ruled that the treble damages statute did not exist. 5) In Renken v. Harvey Aluminum, in which the plaintiffs initially did not seek damages but sought injunctive relief, U.S. Judge John Kilkenny deferred a decision on damages pending the result of pollution control improvements made at the aluminum smelter at The Dalles, Ore. A settlement was reached in September 1966, followed by arbitration in 1970-1971, at which point the plaintiffs sought treble damages. U.S. Judge Gus Solomon ruled that the statute did not apply, which was affirmed by the Ninth Circuit Court of Appeals. 6) In Meyer v. Harvey Aluminum, the jury awarded the plaintiffs $500,000 in damages following a six-week trial, and state Judge William Wells trebled the amount using the Oregon statute. The Oregon Supreme Court overruled Wells, denying the treble damages by saying the statute did not apply. Yerke noted that 24 air pollution cases filed against the AAC plant were pending in Flathead County District Court in Kalispell under Judge Robert Sykes. In Wright v. Anaconda Aluminum Company, argued in 1977, Sykes denied the demand for treble damages, saying the Montana statute did not apply. [16]

Justice Department attorney Steven Herman responded to the defendants' arguments over pre-emption and jurisdiction. He noted that the Montana Clean Air Act allowed persons to pursue common law actions and that the U.S. was a person. Herman said the present case was very simple, "the sort of action which predated" the Montana Clean Air Act or other pollution acts. The plaintiffs were not seeking to establish a new fluoride emissions standard. "We want the emissions reduced to a level so that the forest and the trees are not damaged," Herman said. "That is all." He called the present case "a classic lawsuit" in which "one party has hurt the other." He noted that deferring the case to the Montana Board of Health would not reduce the burden on the federal court. "This case will not go away," Herman said. "The consideration and evaluation of the complex expert testimony just cannot be avoided." He noted that the Justice Department had waited to file the complaint until it had satisfactory data. He also noted that the plaintiffs would likely seek a preliminary injunction in the future, depending upon the outcome of additional analysis of the data. [17]

District Attorney Robert O'Leary spoke next for the plaintiffs. He noted that the plaintiffs were bringing a common law trespass actions as the sovereign and as the trustee of the Flathead Forest and Glacier Park. He noted that the evidence would show that Forest and Park lands were damaged by fluoride emissions from the AAC plant, and damages would continue and increase unless some type of injunctive relief was granted. As for the matter of charging ARCO and the Anaconda Company in the amended complaint, O'Leary said the discovery process was not completed. Judge Smith noted that if ARCO acquired the Anaconda Company instead of merging with it, then there would be two entities. Smith also agreed that it was premature to dismiss ARCO but deferred ruling on that matter. He noted that it could become very difficult to distinguish between fluoride emitted by the plant when it was owned by the Anaconda Company and fluoride emitted when it was owned by ARCO. As for the matter of seeking treble damages, O'Leary noted that Montana law did not specifically limit treble damages to cases where persons trespassed on land to cut timber. The Montana law "simply says whoever injures trees,"

he said. He noted that the Oregon statute said "willfully injures" and the Montana statute said "wrongfully injures." The Montana statute did not specify how the trees were injured, O'Leary said. [18]

Judge Smith issued an opinion and order related to the interrogatories, discovery and pre-trial arguments on Nov. 1, 1979. He noted that the state had established a fluoride emission limit for the AAC plant of 864 pounds per day at full capacity, but the plant had not met the standard and had been operating under annual variances since 1974. The state government was also in the midst of considering a new ambient air quality standard for fluoride to be measured in the air and in vegetation. At the same time, the EPA had adopted a fluoride emission limit of 1,000 pounds per day for new stationary sources but had not adopted ambient air quality standards for fluoride. Smith said he assumed the state emission limit of 864 pounds per day would be the enforceable standard in the current case. He also noted that the plaintiffs alleged that the AAC plant was emitting 4,000 pounds per day, and that the plaintiffs claimed that fluoride emissions above 200 pounds per day would damage vegetation and wildlife in the Flathead Forest and Glacier Park. The defendants had argued that the U.S. was prevented from suing for injunctive relief because of wording in the federal Clean Air Act, but Smith disagreed – nothing prevented the U.S. from suing for injunctive relief to stop the fluoride emissions. [19] Smith also denied the defendants' motion to strike all references to wildlife in the case. The plaintiffs had sufficient interest in protecting wildlife on its property Smith said. [20]

Success and settlement

AAC representatives asked the Montana Board of Health for its seventh year-long variance from state air quality standards during a hearing in Helena on Nov. 16, 1979. The last variance had expired on July 1, 1979. Sneddon, Smith and Don Everett, vice president of AAC's primary operations, said the aluminum plant had reduced fluoride emissions from a high of 4,005 pounds per day to 1,112 over a five-year period. The latter figure was recorded in October 1979. According to Sneddon, the drop in fluoride emissions was a result of changing the reduction pots to the new Sumitomo process. All 600 pots would be converted by April 1980, and the plant would be in compliance with emission regulations by July 1, 1980, Sneddon said. [21] The AAC representatives said they were disappointed that the company had failed to meet the original June 1, 1979 deadline, but they needed more time. Everett said the company had spent nearly $38.6 million trying to meet the 864-pound per day fluoride standard. Smith noted that as pollution levels were reduced, medical tests on plant workers had shown "much better results." Norman Larson of Helena, an economist for AAC, described to the board the impacts to the local economy if the variance was denied. The AAC plant was the largest industrial facility in Montana, employing 1,044 workers at an average income of $17,592 per year. [22]

Donald Pierce, representing the Forest Service and Glacier Park, asked the board to deny AAC's request, but the board took no action. Pierce noted that the National Park Service had observed fluoride-caused damage to pine trees in 1957, within two years of the AAC plant beginning operation. Richard Steffel, a University of Montana student representing the Canyon Coalition and its 250 members, told the health board that all conifers within a mile of the AAC plant had died, according to a 1978 estimate. That added up to 10.7 million board-feet of lumber lost to death or reduced growth. "The process of making the plant comply with state fluoride emission standards has gone on far too long," Steffel said. [23]

The Montana Board of Health granted the variance to AAC on Jan. 11, 1980. The plant was allowed to exceed the state standards for fluoride emissions until July 1, 1980, while it completed the conversion to the Sumitomo process technology. The board's action prompted a Whitefish couple to bring a $750,000 lawsuit against ARCO, AAC's parent company, on the grounds that pollution from the plant had damaged acreage the couple owned on the backside of Teakettle Mountain. Lois E. and Adam G. Alexander claimed that pollution since 1971 had damaged timber and foliage on their lands. In addition to damages, the couple asked that the company be forever enjoined from "casting fluoride, pollutants, fumes and particulates" on their property. Merritt Warden, an attorney representing the plant, estimated that between 15 and 20 local lawsuits against Anaconda were pending. [24]

By February 1980, all 600 reduction pots at the AAC plant had been converted to the Sumitomo process. "All environmental aspects of the project appear very promising," said Don McMillan, the project manager for the conversion project. "Other areas of performance, including energy consumption, chemical and carbon consumption and production output, are also looking good." The original intent of the big conversion was to reduce fluoride emissions and bring the plant within Montana state guidelines, but other benefits included reduced electrical consumption and improved safety and hygiene. The conversion involved rebuilding five reduction pots per week, a demanding construction load on the plant as it continued to operate, but once the rebuilding was complete, technicians could begin fine-tuning the process. Other modernization efforts for 1980 included the acquisition of new ECL pin-pulling cranes from France, which were expected to arrive by November 1980; the operation of a newly designed ore truck to deliver alumina to the reduction pots; the experimental trial of air pollution control units from France, which would be mounted on the roofs of the potrooms to reduce particulate emissions; and the experimental trial of new air pollution monitoring equipment, purchased from Alcoa after fluoride emissions at the AAC plant had exceeded the testing limits of existing monitoring equipment. In April 1980, the AAC plant's fluoride emissions averaged 738 pounds of fluoride per day, well below the state air quality standard of 864 pounds. [25] The big conversion had brought the plant within the state's fluoride emission standards, reduced electrical use by 15% and improved working conditions inside the pot rooms. [26]

In May 1980, AAC began testing a new air quality monitoring system to determine the amount of fluoride emissions leaving the Columbia Falls plant. According to Lee Smith, the plant's technical operations manager, "We have our pollution level down to the point where we are approaching the accuracy limitations of the existing monitoring equipment." The new system was developed by Alcoa and was accepted throughout the aluminum industry. The plant's variance from the state fluoride emission standard continued through June 30, 1980, after which time fluoride emissions could not exceed 864 pounds per day. Sampling at the plant for the week of April 14 through 20, 1980 showed emission levels of 738 pounds per day. AAC and the state of Montana had previously agreed that an outside consultant would do the actual testing to ensure the plant was within compliance, but it was AAC which recommended the new air quality monitoring system. Emission monitoring at the plant was conducted at two types of locations – at the two main dry scrubber systems which treated pot gases, and along the clamshell vents on top of the long potroom roofs. The roof monitoring system used two 115-foot long manifolds to draw in potroom air which normally vented out through the roof by

convection and was not treated by a scrubber system. The new monitoring system could adjust the air flow inside the manifold to mimic the air flow in the clamshell vents. [27]

On July 7, 1980, as it became clear that a settlement was nearing in the lawsuit brought by the Forest Service and Glacier Park against AAC, Clint Carlson testified in U.S. District Court in Missoula about air pollution improvements at the Columbia Falls smelter. Carlson said fluoride emissions were below the state standards and "have been for three or four months." He said he had seen improved growth on conifer foliage in polluted areas near the plant on a recent visit. "The new foliage coming out of the conifers is staying green," Carlson said. "There's no question that there's a big improvement." AAC plant spokesman Jack Canavan confirmed that a settlement appeared to be "imminent," and if all went well should be completed by the following week. [28] On July 10, the Hungry Horse News reported that an out-of-court settlement was near in the federal air pollution lawsuit. In the time since the lawsuit was filed on Nov. 3, 1978, AAC had completed several air pollution control projects, and fluoride emissions were staying below the maximum level allowed by the state of Montana, the newspaper reported. In spring 1980, Justice Department lawyers accompanied local Forest Service personnel to review damage to areas named in the lawsuit, primarily on and around Teakettle Mountain. The group determined that the AAC plant was meeting emission standards and that timber on the north and east sides of Teakettle Mountain was recovering. One proposal for settling the case involved a land swap between the company and the government. [29]

The Billings Gazette proclaimed AAC's success on July 9, 1980, reporting that "a secret Japanese process has dramatically reduced air pollution from Anaconda Aluminum Co.'s plant, and the U.S. Justice Department reportedly is settling its suit against the company out of court." [30] On July 17, the Hungry Horse News congratulated the AAC plant as it celebrated its 25th anniversary, commending the plant for reducing air pollution and installing energy-conserving equipment. "Notable changes are evident, not only in the physical plant but in the company's concerns," the editorial said. "The environment is the biggest and possibly the most important." [31] Tours of the smelter were provided to workers' families and invited guests on July 15 as part of the 25th anniversary celebration, and visitors were able to see the new Sumitomo equipment for the first time. The two-year conversion had cost $42.4 million. Lee Smith said the Sumitomo process was no longer a secret because the Japanese company had sold its process to virtually every aluminum plant in the world that used the same type of Soderberg reduction pots. [32]

A 25th anniversary banquet was held at the Outlaw Inn in Kalispell on Friday, July 18. ARCO Chairman and CEO R.O. Anderson told the audience that he was glad the Anaconda Company had chosen this area to build an aluminum plant. "I don't know who had the wisdom to pick this area but it was a unique decision," he said. "Montana is a beautiful and remarkable state… I was asked earlier what would the valley be without the plant. I ask what would the plant be without the valley?" He urged Montanans to retain the beauty of their state while promoting the state's economy so young people would not move away. Lt. Gov. Ted Schwinden gave the AAC plant a "passing grade" in meeting environmental standards and pointed out that the plant "proves the balanced growth concept works." About 2,300 people attended the 25th anniversary celebration at the plant the next day despite intermittent rain showers. The company handed out 3,000 gift bags and hundreds of Frisbees while Jason's, a caterer, served up 6,500 hot dogs and 10,000 soft drinks. [33]

The federal lawsuit brought against the Anaconda Aluminum Co. came to a sudden end in 1980, but the circumstances behind the settlement were never reported in the media. Conventional wisdom was that the government had overwhelming evidence proving that fluoride emissions from the aluminum plant in Columbia Falls had damaged Forest Service trees, and that AAC had managed to comply with state fluoride emission standards by spending millions on new reduction cells and primary pollution control equipment. This version assumed that the Anaconda Company had given up defending its case, which didn't align with the giant mining company's historical legacy.

Much of the back story of the federal settlement is revealed in a "non-security confidential" contemporaneous report that Glacier Park Superintendent Phillip Iversen wrote about a Feb. 5, 1980, meeting in Kalispell with 10 Forest Service officials and U.S. Attorney Ezra Rosenberg. Officials present at the meeting included Deputy Regional Foresters Ev Towle and Al Trout, Forest Service General Counsel Larry Jacob, Forest Service Land Acquisition officers Warren Illi and Vince Price, Flathead National Forest Supervisor John Emerson, Flathead Forest Deputy Supervisor Bob Gibson, Al Labor from the Forest Service's Glacier View District, and Forest Service scientists Clint Carlson and Don Pierce. Clinton Carlson spoke first, noting that he was impressed by the improved growth and new shoot development of trees on the east side of Teakettle Mountain since 1977. While that was good news and supported movement toward a settlement, news about the lawsuit was not uplifting. "Discussion around the table indicated that the U.S. Attorney's Office feels the government case is a loser," Iversen stated in his report. "One option is to recess the case until more field data is collected." Carlson told the group that Clancy Gordon was nearly done with a wildlife study, and a meteorological study was underway to predict fluoride intensities. In addition, plant pathologist John M. Skelly had collected samples on the east side of Teakettle Mountain on Feb. 4, 1980, indicating accelerated vegetative growth, Carlson said. [34]

Skelly was a professor at Virginia Polytechnical Institute's Department of Plant Pathology and Physiology, where he was a plant pathologist and taught courses on forest pathology and air pollution studies. Students and faculty in the department conducted studies of the impacts of ozone, sulfur dioxide and nitrogen dioxide emitted by coal-burning facilities on plant life, including acid rain. He later went to the Penn State College of Agricultural Sciences Department of Plant Pathology and Environmental Microbiology, where he was the department head from 1982-1985. [35] In an April 2017 email, Skelly recalled that he was asked by the Forest Service to review Carlson's Ph.D. dissertation on the impacts of fluoride emissions from the AAC plant on plant life in the Flathead Forest and Glacier Park. "I found many questionable aspects of the dissertation and wrote a report to the USFS," Skelly wrote. "As I forest pathologist, I was well aware of the occurrence of white pine blister rust in Montana and surrounding states and recall photos of dying white pines as a part of Carlson's dissertation." Skelly noted that Carlson had reported no notable impacts from white pine blister rust. "I was then invited by the USDA-Forest Service as an on-site private consultant for a personal look at the supposed damages as purported to be caused by hydrogen fluoride emissions from the ARCO facility." [36]

Skelly said in his 2017 email that he conducted ground and helicopter surveys and found major infections and mortality of western white pines (Pinus monticola) caused by white pine blister rust (Cronartium ribicola) and wrote a report relaying this significant finding back to the Forest Service. "We had included a landing on the top of Teakettle Mountain, and there was little doubt about direct

impacts to the adjacent forested area on the slopes facing the source," Skelly said about fluoride impacts, adding, "A few additional landings within Glacier confirmed the presence of cankers of white pine blister rust." In the following spring, Skelly was asked by ARCO to continue studies of air pollution impacts as a consultant working alongside Mike Britton, who was already working as a consultant for ARCO. "We set up a grid pattern of sites and visited each with the intention of looking for typical hydrogen fluoride symptoms but primarily found further evidence of significant white pine blister rust and only a few ground plants with symptoms of hydrogen fluoride as may have had exposure to the pollutant," Skelly said. "Another field-assessment report was written by Mike and me directly to ARCO, and following the completion of the hearings, Mike and I approached ARCO with the intent of publishing the report in the 'Plant Disease Reporter.' That request was declined with the clear statement that our work was the property of ARCO and not for the general public. This was of course an OK decision by both Mike and me." The "Plant Disease Reporter" was published by the American Phytopathological Society. Skelly also recalled stepping off the helicopter and disappearing into five-foot deep snow, and later in the spring quickly abandoning one of their grid plots after Britton found fresh grizzly bear scat. [37]

According to Iversen's report on the Feb. 5, 1980 meeting, Skelly did not think damage to trees on the east side of Teakettle Mountain could be traced back to fluoride, and Skelly was critical of Carlson's thesis. "Apparently he feels there is incomplete collection of data," Iversen reported. "There was improper correlation between tree core samples and needle collections. In fact, in 40% of the cases, needle samples did not come from the target, core sample trees. The volume of mortality loss in statistical fluoride data actually contradicts false-color infrared photo interpretation." Later in a private meeting with the top Forest Service officials and Iversen, and with Carlson absent, Rosenberg went into more detail on the weakness of the case based on Carlson's research. Rosenberg said Carlson's analysis "led to some very questionable conclusions," Iversen reported. Another problem found by Skelly, according to Rosenberg, was that tree mortality conflicted with false-color infrared data because field personnel included all mortality – "even from fire," Iversen reported. "This fire mortality actually accounted for 94% of all the dead trees. This was not explained and led one to believe mortality was caused by fluoride." [38]

Rosenberg said another problem cited by Skelly was that "core samples were improperly collected" and did not correlate with the full diameter disk samples, Iversen reported. In the 100 isopol area, Carlson had found 34% of the trees had died from fluoride when it was later found that 94% had died from fire. In the 30 isopol area, there was 14% mortality, and in the 10 isopol area, there was 2% mortality, Iversen reported. Rosenberg told the officials that there was no question that fluoride caused damage, but Carlson's study went too far and was too complicated, according to Iversen's recounting. Rosenberg also said Carlson lacked a strong enough math background or the support of mathematicians to draw the conclusions he did in his thesis. On top of all that, there was a problem with another expert witness for the government, Rosenberg said. "Anaconda is also aware that Dr. Clancy Gordon, who did some of the research for the Environmental Protection Agency in Glacier National Park, was recently caught in an outright lie in court testimony," Iversen reported. "The U.S. Attorney said he has never encountered a case where the judge gave such a serious reprimand to an expert witness. Dr. Gordon would probably

be a government witness and his credibility has been seriously damaged. His bias has overcome logical arguments." [39]

Meanwhile, the AAC plant in Columbia Falls was coming closer to complying with the state fluoride emission limit of 864 pounds per day as it completed installing new air pollution control equipment. Rosenberg said that if the federal government continued to press the case, the legal discovery process could last another year, and neither the Forest Service nor Glacier Park was interested in a land exchange. But AAC had made an initial move toward a settlement, Iversen reported. "Apparently this litigation has caused them problems with the Securities and Exchange Commission. Specifically, the merger with Atlantic Richfield. Anaconda is fully aware of all the information the government possesses. They have hired the world's best experts in fluoride emissions and have five legal firms working on this case. They apparently know they have a sound case," Iversen reported. An Anaconda official had told the government, "Let's cut out the crap, get down to the facts, and settle this case promptly," Iversen reported. The Forest Service officials and Iversen continued to discuss legal strategy options. "We felt the best settlement would be that Anaconda Company establish a good monitoring system, and from this data, we might eventually determine what the acceptable levels of fluoride for state air quality standards actually should be," Iversen reported. "This leaves open for future action if the fluoride problem needs to be settled in court." Iversen said he had agreed with that proposal. "We certainly do not want to go to court, lose this case, make a fool of ourselves." [40]

Iversen's report on this legal strategy meeting made its way to Glacier Park Air Quality Coordinator Robert Hall, who sent a memo to Glacier Park West Lakes District Ranger Louis Hendricks about the matter on Feb. 25, 1980. Hall noted how Iversen had supported a settlement that would rely on AAC monitoring future air quality related to the plant. "As Air Quality Coordinator, I wish to express a certain amount of caution be taken in relation to this research option," Hall said. "If this research option is agreed upon, as an out-of-court settlement, we should be very emphatic in making sure that all procedures relating to research, which involves Glacier National Park, scrupulously follow all the requirements for conducting research within the park." In response to criticism of the government's fluoride research so far, Hall said he wanted investigations in Glacier Park to 1) follow sound scientific principles; 2) be approved by Glacier Parks' Research Division before any go-ahead was given; and 3) involve the state's Air Quality Bureau in an advisory capacity. [41]

The plaintiffs and defendants agreed to dismiss the federal air pollution case following a pre-trial conference on Jan. 18, 1980. [42] On Feb. 20, District Attorney Robert O'Leary wrote to Flathead Forest supervisory forester Warren Illi with a suggestion on how to place a value on Forest Service land on Teakettle Mountain to settle the case. O'Leary referred to a 1968 case where the Bonneville Power Administration ran a high-voltage transmission line across property owned by the Dehlboms near the AAC plant. In that case, a commission appointed by Judge Smith determined that the Dehlbom's 160-acre property was "industrial buffer zone property." A real estate broker who testified in the Dehlbom case said the Anaconda Company typically paid market value or higher for "industrial buffer zone property." O'Leary told Illi, "I firmly believe that Teakettle Mountain has only one highest and best use and that is as an industrial buffer zone, and accordingly the market value should be appraised on that basis." O'Leary noted that any other appraisal would come in too low. [43]

The federal lawsuit was reportedly settled in early August 1980 when terms were reached for a land exchange. Forest Service lands on Teakettle Mountain that were allegedly damaged by fluoride emissions from the aluminum plant were to be swapped for 3,300 to 4,000 acres of Anaconda Company-owned timberland located up the North Fork of the Flathead River. The land exchange was based on the estimated value of the lands and not on an acre-for-acre basis. Lands acquired from the Anaconda Company were required to have wildlife, recreation and timber production values. The Anaconda Company already owned much of the western side of Teakettle Mountain, but the land exchange consolidated nearby holdings on the west, southwest and southern slopes of the mountain. The terms of the exchange dictated that the Anaconda Company should continue to manage the lands on Teakettle Mountain in a similar way to how the Forest Service managed its lands. The lawsuit filed in November 1978 had asked for a permanent injunction against the AAC plant's fluoride emissions, but after spending $42.4 million installing new technology designed to reduce air pollution, emissions had remained below the state standard of 864 pounds of fluoride per day. "The Forest Service's primary objective of getting fluoride emissions reduced has been met," Flathead Forest Supervisor John Emerson said. "During the last few months, the emissions have been within the state emission standards. Forest Service scientists have acknowledged that vegetation on Teakettle Mountain has resumed near normal growth and vigor." [44]

Judge Smith ordered the case dismissed with prejudice on Aug. 14, 1980. The order was signed by Krest Cyr, James Robischon and Robert Smith for ARCO and the Anaconda Co. and by Robert O'Leary, Ezra Rosenberg and Wendy John for the U.S. Attorney's Office and by Ron Peterson for the Forest Service. [45] Final details for the land exchange were still being ironed out by February 1982. According to the terms of the settlement, AAC agreed to either pay $75,000 or to make a land exchange. In the land exchange, AAC would give the Forest Service 2,001 acres of land near Coal Creek in the North Fork of the Flathead River drainage and receive 5,339 acres of Forest Service land on Teakettle Mountain. The lands were appraised at approximately equal value. AAC intended to purchase the Coal Creek land parcel from a group of private investors called Silver Bow Flathead Realty and then make the swap. The Teakettle land parcel was isolated, with only half of it useable for long-term timber management and the rest being rocky with sparse vegetation. AAC already owned most of the land on the west side of Teakettle Mountain, and consolidation of the two parcels would make management of the land easier. Flathead Forest officials were preparing an environmental assessment for the land exchange. [46] On July 26, 1982, the U.S. Attorney's Office for the District of Montana received a check for $75,000 from ARCO labeled "payment in full of the compromise settlement agreement." [47]

The expert witnesses

Iversen's report on the Feb. 5, 1980 meeting with Rosenberg did not specify the date when Gordon was reportedly caught lying on the stand, but Gordon in many ways was not a typical expert witness. Gordon gave an early example of his controversial style while testifying in the Meyer v. Martin Marietta fluoride case in Hood River, Ore., on Oct. 31, 1973. Under cross-examination by Frederic Yerke, Gordon recounted how he was "bawled out by the judge" in the case brought against the Rocky Mountain Phosphate Co. in the mid-1960s. Disappointed in how the state judge had ruled in the case, Gordon and Elizabeth Hannum, a University of Montana Forestry School employee, had written a long opinion piece

describing the pollution in Garrison, Mont., and sent it to newspapers across Montana in October 1966. The state district court judge did not appreciate an expert witness in one of his cases going public like that. The matter was brought back up four years later when Gordon spoke to the Federation of Western Outdoor Clubs at a ski area near Missoula on Aug. 26, 1970, which was covered by a local newspaper. Gordon confirmed under cross-examination that he told the group that "the law stinks" because judges were ignorant of environmental issues. [48]

Gordon went on to testify in the Meyer v. Martin Marietta case that he believed in "trial by newspaper," adding that newspaper coverage tended to be "bad" – almost as bad as television – and that the press generally gave polluters better press coverage than environmentalists. Gordon also recalled in his testimony how the Anaconda Company interfered with a news story being done by the CBS 60 Minutes television show in 1970. Gordon explained that he had received a $50,000 grant from the National Science Foundation, of which about $20,000 went toward making a movie about energy reserves and future needs. The movie won second place in a national movie contest, and CBS wanted to do a news story about the movie. Gordon said about 12 minutes of the movie was about the Anaconda Company, and the company was upset about the movie. Gordon said the company sent letters to the president of University of Montana and exerted pressure on CBS, which in the end did not include Gordon or the movie in its television story. [49]

Gordon supported his use of colorful language during his testimony in the Meyer case. Under cross-examination by Yerke, Gordon confirmed that he had quoted Mao Tse-tung, noting that "so has President Nixon," and Black Panther leader Eldridge Cleaver. Gordon added that he also had quoted from Mahatma Gandhi. When asked by Yerke if he had referred to other expert witnesses in air pollution cases as "biowhores," Gordon said yes, a number of times. He added that another term for these scientists would be "hired guns," and Gordon agreed that he, too, was a "hired gun." Gordon recalled that in the early days of the Environmental Protection Agency, the agency was unable to find scientists who would testify against industry, while many scientists could be found who would testify for industry. Yerke countered by naming scientists who had testified against industry in air pollution cases, including David F. Almonding, Vern Miller, Don Adams. O.C. Compton and Joseph Schulein. Gordon responded by noting that some of the scientists Yerke named had worked a decade prior to Gordon, and that Adams now worked for industry. Gordon also noted that there were people "begging for help around these fluoride polluting sources and cannot get help, they cannot get help from the federal agencies and can't get help from state agencies in many cases." [50]

Gordon's sharp criticism of expert witnesses that supported industry was part of his arsenal in his fight against pollution. On Dec. 31, 1970, Gordon wrote back to Joseph Pemberton, an attorney in Portland, Ore., who represented plaintiffs in air pollution cases filed against aluminum companies and was seeking advice about hiring expert witnesses. In his letter, Gordon called Leonard Weinstein, Don Adams, A.C. Hill and Mike Treshow "biowhores," noting that Treshow in the past had served as a witness for Harvey Aluminum and the Anaconda Aluminum Co. Gordon also noted that some of the scientists who had served as expert witnesses for aluminum plants had been on the faculty at Washington State University – which was Gordon's alma mater. "As a graduate of Washington State University, I know the general philosophy of its professors, which doesn't make me too proud of the institution," Gordon wrote. [51]

Gordon also wasn't afraid to discuss his unusual style. In May 1977, Gordon and his research associate at the University of Montana, P.C. Tourangeau, responded to a critique of their 73-page report on fluoride pollution by the Eastalco aluminum plant in Frederick, Md. The critique was written by the plant's technical manager, W.J. Jansen. In the ninth of a dozen numbered responses, Gordon and Tourangeau responded, "Yes, Gordon is a gadfly, an environmentalist, an individual who attacks other scientists' studies and motives when they deal with allowing a decrease in environmental quality," the authors said. "While the lawyers representing polluting industries have a heyday with Gordon's environmental verbiage and philosophies, they have never been able to refute the scientific data that comes from this laboratory. The major reason for this is that the eleven staff members of the laboratory do their work accurately and with extreme care." [52]

Another example came when Gordon offered his expert help in a letter to the Clatsop Environmental Council on Feb. 22, 1972, after they requested assistance in stopping Amax from building an aluminum smelter on Youngs Bay near the mouth of the Columbia River. Gordon had traveled to Astoria, Ore., and spoken to the group earlier on Feb. 17. Power for the new smelter would come from the Trojan nuclear plant located about 20 miles upriver. [53] About a year later, Gordon wrote to Fred A. Glover, the director of research for the Thorne Ecological Institute in Boulder, Colo., about potential water pollution problems by the Amax project. On the whole, Gordon said the principal investigators chosen to conduct a baseline study for the project had good backgrounds, but he was concerned that four of the five scientists came from Oregon State University. [54]

"This concern does not arise from the scientific qualifications of these individuals but rather from the possibility of them having a homogeneous political and economic philosophy of industrial growth and, thus the ensuing industrial pollution," he told Glover. "You may be of the opinion that scientific objectivity is so well instilled in scientists that other taught, self-learned and developed philosophies on subjects such as politics and economics play no part in decision making on how scientists carry out their scientific investigation. However, I do not accept this 'normal' belief and especially for the writers of this proposal. The reasons for this disbelief is based upon their apparent complete lack of knowledge that there currently are other aluminum smelters in Washington and Oregon dumping their waste effluents in fresh or salt waters." Gordon cited the Intalco aluminum plant dumping wastes into the Strait of Georgia and the Martin Marietta aluminum plant dumping wastes into the Columbia River at The Dalles. Gordon also had concerns about the influence of Amax on the proposed study. "If there is no open communication between the investigators and personnel of Amax, then my obvious feelings are that Amax is funding a $400,000 project for window dressing and to 'show' the public how many Phuds (Ph.D.'s) they hired because of their 'desire' to have no or little effect upon the estuaries of Youngs Bay." [55]

It takes a certain amount of courage and stamina to tilt at windmills backed by powerful gusts, but Gordon occasionally received his just rewards. On Dec. 11, 1978, Arden Shenker, an attorney from Portland who represented the plaintiffs in the Zimmerman v. Eastalco air pollution lawsuit in Maryland, wrote to Gordon to thank him for his work. The jury had awarded the Zimmermans $65,000, Shenker said. "My impression is that the jury valued your testimony far more substantially than they considered the testimony of David MacLean," Shenker wrote, citing a scientist from the Boyce Thompson Institute

who testified for Eastalco. “We intend to interview the jurors, and that is something that we may be able to determine with more accuracy after interviews. From our standpoint, we know how much more valuable was your testimony than anyone else’s whom we have ever seen. With those kind things having been said, of course, we remit nothing in payment for your services. I know that that fact will be of no concern to you because the greatest reward for the job well done is to know that you did it, not to be paid for it.” It should be noted that Gordon received money for travel expenses and for laboratory expenses, which went back into his laboratory at the University of Montana. [56]

Gordon also received help from the public when he was under attack. On May 20, 1977, a group of farmers who owned property near the Eastalco aluminum plant wrote to University of Montana President Richard C. Bowers to refute an earlier letter sent to Bowers by Maryland Agriculture Department Secretary Young D. Hance that was critical of investigative work conducted by Gordon for the Zimmerman case. Gordon had taken samples from the farms owned by the “Concerned Citizens” who wrote the letter to Bowers. “We are the farmers whose properties he visited and would like to make it known that he conducted these tests at our request, because we had mistrust in our minds of the testing already being done,” the farmers wrote. “There is definite proof that the feed and silage sampling is being conducted in a questionable manner resulting in unfavorable reports or the lack of reports. These were the basic reasons for asking Dr. Gordon here. Contrary to Mr. Hance’s statement that Dr. Gordon created psychological uneasiness on our part, it was just the opposite. We consider ourselves fortunate to have had him here.” The farmers said that Gordon’s work reflected well on the University of Montana. “The credibility and reputation of your institution has only been enhanced by Dr. Gordon’s efforts,” they wrote. “The feeling is shared by many more than just us.” [57]

Criticism of Clinton Carlson’s investigative work by John Skelly, cited in Glacier Park Superintendent Phillip Iversen’s account of the Feb. 5, 1980 meeting with U.S. Attorney Ezra Rosenberg, was also seen as damaging to the federal lawsuit brought against the Anaconda Company. Carlson’s Ph.D. dissertation was the key body of proof showing that the AAC plant in Columbia Falls had damaged vegetation in national forest lands, and the Forest Service had asked Skelly to come to Montana and review Carlson’s work. This was not the first time Carlson’s work was criticized by attorneys for the aluminum industry. As a Forest Service plant pathologist, he had first reported on fluoride impacts in the Flathead National Forest in 1969, and he and Jerald E. Dewey, a Forest Service entomologist, had jointly published “Environmental pollution by fluorides in Flathead National Forest and Glacier National Park” in 1971. [58]

Carlson and Dewey’s work was questioned during testimony in Hood River, Ore., on Oct. 31, 1973, in the Meyer v. Martin Marietta Aluminum Co. case. When asked by Frederic Yerke, the attorney for Martin Marietta, Gordon confirmed that a report by Carlson and Dewey about impacts to forests near the AAC smelter did not correlate with data from samples sent to the Wisconsin Alumni Research Foundation. Gordon agreed there was a problem with the Carlson-Dewey report cited by Yerke and that it was inaccurate. Yerke also brought up a 3 1/2 hour long dinner meeting that Gordon and Carlson had in Missoula with Lamar Tooze, Arden Shenker and William Sheridan, attorneys for plaintiffs in several air pollution cases. Carlson was scheduled to give a deposition in an air pollution case. At one point during the dinner meeting, Shenker reportedly asked for a dollar from Carlson so he could be considered an attorney for Carlson and the details of the dinner conversation could be kept confidential. Yerke inferred

that the purpose of the meeting was to "prep" Carlson for his deposition. Gordon told Yerke he recalled something like Yerke's version of the dinner meeting, but he noted that the purpose of the meeting was to get Carlson to relax and not sweat the upcoming deposition. [59]

Gordon was the Carlson's dissertation review committee chairman. Carlson's 165-page dissertation on "Fluoride induced impact on a coniferous forest near the Anaconda Aluminum plant in Northwestern Montana" was approved on June 2, 1978. Among the professionals Carlson acknowledged in his dissertation were Charles VanHook, "for his expert help with the fumigation experiment," Robert Eder and Wayne Bousefield, "for their assistance in data analysis," and Mike Marsden, a biometrician who "gave me sound, constructive criticism on statistical analysis of the data." [60] The statistical analysis of aerial infrared photography in Carlson's dissertation was questioned at length during Carlson's deposition in the U.S. v. Atlantic Richfield Co. lawsuit on Nov. 26, 1979. Attending the deposition were Steven Herman and Ezra Rosenberg, from the U.S. Justice Department; attorneys Fredric Yerke, Sherman Lohn, Robert Smith and Brigid Henrie; and Don Ryan and Lee Smith, from the Anaconda Aluminum Co. [61]

According to Carlson's dissertation, "Stepwise multiple linear regression and covariance analysis were the primary statistical methods used to sort and compare data concerned with the relation of fluoride to needle pathologies and growth impact." Carlson said his data analysis conformed to techniques described by Snedecor in 1956, Steel and Torrie in 1960, and Sokal and Rohlf in 1969. Interpretations of the data were made to find the relationship between fluoride levels and the foliar characteristics, growth impact and mortality of the conifers in the study. In the discussion section of his dissertation, Carlson noted that, "Statistical analyses are not proof of a causal relationship; however, they do enable one to make probability statements about events in time and space, such as the association of fluoride with conifer foliage abnormalities, reduced radial and height growth, and other characteristics, and they can be used to support or refute hypotheses of biological events." Carlson said his "dissertation dispels the insect theory of damage," and he noted that habitat type, aspect and slope were similar for different affected areas of the forest. Carlson said airborne fluoride was not measured for his dissertation, and instead "tissue analyses of fluoride were used as an index of fluoride pollution." With that said, Carlson stated that "based on this data and supportive literature, it is concluded that fluoride from the Anaconda Aluminum Plant caused these adverse foliar effects." [62]

Carlson supported the use of aerial infrared photography to study impacts such as fluoride pollution on vegetation on National Forest lands. "The false color infrared photography, scale 1:4000, clearly showed the fluoride damaged area, and the 1:1200 photography was excellent for making conifer mortality estimates," he said. In estimating the total impact of fluoride emissions by the AAC plant on timber, "Mortality was computed only by counting on the photos standing dead trees; however, many trees dead for 4-10 years, likely killed by fluorides, had fallen to the ground and were not counted." [63] This part of Carlson's dissertation, however, had drawn criticism from Skelly, according to Iversen's report of what Rosenberg said during the Feb. 5, 1980 meeting. Tree mortality conflicted with false-color infrared data because field personnel included all mortality – "even from fire," Iversen reported. "This fire mortality actually accounted for 94% of all the dead trees. This was not explained and led one to believe mortality was caused by fluoride." [64]

James R. Habeck, who was a botany professor at the University of Montana at the time Carlson's dissertation was approved, questioned what was reportedly said at the Feb. 5, 1980 meeting and supported Carlson's analysis. Habeck had enrolled at the University of Wisconsin-Milwaukee in the early 1950s and studied pre-forestry. He worked on white pine blister rust and firefighting crews in Idaho in 1951 to 1953 and completed his bachelor's in botany at the University of Wisconsin-Madison in 1954. He earned his Ph.D. in plant ecology at Madison in 1959 and was hired by the University of Montana-Missoula in 1960. Habeck's study of the interaction of wildfire and forest vegetation was funded by the Forest Service, National Park Service and National Science Foundation, and resulted in 75 publications. The Montana University Board of Regents awarded Habeck an Emeritus Professorship in 1992, and he retired in 1995. [65]

In a series of emails sent from March 10 to 16, 2017, Habeck noted that Carlson's "publication record suggests he was more than qualified as an expert witness on ecological impacts of fluoride fumes on conifer species." Habeck also noted that Mike Marsden, who assisted Carlson for his dissertation, was a professional biometrician who worked at the Forest Science Laboratory at the University of Montana and at the Forest Service's Rocky Mountain Research Station in Missoula. "Clint's testimony had to have been accurate, and not entirely based on Carlson's own statistics skills," Habeck said in an email. "Marsden would've been contacted both before data collection plan and sampling routine, and after dealing with the numerical database. His five-member faculty committee also would have been providing input on study objectives, etc." Habeck also recalled bad experiences dealing with Glacier Park Superintendent William Briggle, who preceded Iversen, and in general questioned Iversen's report on the meeting, noting that Iversen was not a scientist. [66]

New state fluoride standards

It had taken an extra year, but the AAC smelter in Columbia Falls finally achieved the state's fluoride emissions standard through the Sumitomo conversion. But rather than resting on their laurels and getting back to the business of producing aluminum, the company faced a new round of regulatory challenges. In March 1980, the Northern Plains Resource Council published a detailed technical critique of proposed Montana air quality standards prior to a Montana Board of Health and Montana Department of Health and Environmental Sciences hearing scheduled for May. The critique covered sulfur dioxide, particulates, trace metals, lead, arsenic, cadmium, fluoride and ozone. The state's current standard for ambient fluoride was 1 ppb total fluoride averaged over 24 hours; the standard for forage was 35 ppm; and the standard for gaseous fluoride was 0.3 micrograms per cubic centimeter averaged over 28 days. The proposed standard for ambient fluoride was 1 ppb total fluoride averaged over 24 hours or 0.3 ppb averaged over 30 days or 0.13 ppb averaged over the growing season; the proposed standard for forage was 30 ppm fluoride; and no change had been proposed for gaseous fluoride. [67]

According to the Northern Plains Resource Council critique, industrial fluoride sources in Montana included the AAC plant, the Stauffer Chemical Co. plant in Butte, coal-fired generating plants and oil refineries. At the time, no federal standards existed for fluoride emissions, and Montana was one of the few states to adopt fluoride standards. The environmental group noted that Stauffer, which produced elemental phosphorus, was able to stay below the state standard for growing seasons, but forage near

the plant still accumulated fluoride. This point had been presented to the Montana Air Quality Bureau but was not addressed in the draft environmental impact statement for the new air quality standards, the environmental group said. The AAC plant had emitted 225 tons of fluoride in 1979, and elevated levels of fluoride had been found in plants and animals in a 375-square-mile area around the smelter in Columbia Falls. According to the Feb. 7, 1974 Draft EIS for AAC's air pollution variance, state officials believed AAC should be able to meet the state's air quality standards, but AAC officials had said they might not be able to meet them, the group noted. [68]

The EPA set standards for fluoride emissions at aluminum smelters in June 1980. The new regulation limited Soderberg-type smelting plants to 2.0 pounds of fluoride per ton of aluminum produced and prebake plants to 1.9 pounds. To meet the EPA requirements, the average aluminum smelter needed to capture at least 95% to 97% of the fluorides produced by the pots as primary emissions. [69] According to Dale Pahl, at the EPA's Office of Research and Development in Research Triangle Park in North Carolina, the standards were not based on health effects but on the best available pollution control technology. The reason health data was not used in setting the new standards was because fluoride was considered a "welfare" pollutant, not a "hazardous" pollutant. Pollutants that affected livestock, plants and other property were considered welfare pollutants. To be considered hazardous, there had to be scientific evidence that adverse health effects could occur following chronic exposure. In addition, the EPA had no ambient standards for airborne fluoride. [70]

In an Aug. 14, 1980 hearing, the Montana Board of Health reviewed an environmental impact statement prepared by the Montana Air Quality Bureau which proposed standards for all types of emissions, including fluoride. The standard for fluoride emissions was 30 ppm of fluoride per gram of dry forage, but the EIS recommended that the standard should be increased to 50 ppm on a monthly basis with an average of 35 ppm during the growing season. The Board of Health voted to accept all the air quality standards proposed in the EIS but then lowered the forage level for fluoride to 20 ppm. The decision caught the Anaconda Aluminum Co. by surprise. Accompanied by the Stauffer Chemical Co., the two companies filed a petition asking for reconsideration, saying they had not had an opportunity to comment on the new standards. Petitions seeking hearings on the other air quality standards were filed by Anaconda Copper, Cenex, Conoco, Exxon, the Western Environmental Trade Association, the Chambers of Commerce, and local governments in Anaconda and Deer Lodge. During a Sept. 19, 1980, hearing in Great Falls, the health board denied AAC's request for a hearing on the new fluoride emission standards. The board also told the petitioners that it would not reconsider any of the standards, including the fluoride standard, but that it would not begin enforcing the new standards until after the board met again in January 1981. [71]

By October 1980, management at the AAC plant was still uncertain about whether the company would sue the state over the health board's stricter fluoride emission standards. Stauffer Chemical had already indicated it would sue the board over the matter. [72] On Oct. 17, 1980, AAC filed a lawsuit suit against the Montana Board of Health in Flathead County District Court claiming the board's new fluoride emission standards were invalid and unenforceable. The company claimed that it had no chance to present new evidence relating to the board's decision to lower the fluoride forage standard from 30 ppm as an annual average to 20 ppm as a monthly average. The company claimed that the board violated the

Montana Clean Air Act by not providing AAC with due process. Furthermore, the company claimed evidence did not exist which supported the need to tighten the standards. AAC's lawsuit cited a Board of Health statement that "there is no indication that cattle ranching is at all affected in the vicinity of the plant." In a separate action, Stauffer Chemical Co. filed a similar suit against the board two weeks earlier. [73] AAC also claimed that the health board had exceeded its authority and cited some procedural errors in the state's rule-making process. [74]

There were other pressing problems for the aluminum plant. AAC General Manager Bob Sneddon spoke about the plant's future at a Columbia Falls Chamber of Commerce meeting on Nov. 11, 1980. Adding to the aluminum plant's air pollution problems were concerns about ARCO's decision to shut down operations in Anaconda and Great Falls. Sneddon assured the crowd that closures elsewhere in the state would not affect the aluminum plant. The future of the aluminum plant depended on the uncertainty of electrical power distribution in the Pacific Northwest, air pollution standards being set by the Montana Board of Health and the need for the plant to remain competitive in the global aluminum market. Sneddon noted that the Bonneville Power Administration had announced in 1976 that, due to increased demand in the Pacific Northwest, there would not be enough power for all customers by 1983. AAC's power contract would expire in 1987. Sneddon also addressed the company's recent lawsuit charging the Montana Board of Health with setting unfair fluoride emission standards. "We're fighting for our life and doing everything we know how to do to meet the standards, but the standard of 20 parts per million is not practical," he said. "ARCO's position is this: If a plant operation cannot meet air quality standards in an area, then they'll shut it down." [75]

In December 1980, the Hungry Horse News interviewed Dale McGarvey, the Kalispell attorney who had represented dozens of local property owners in lawsuits that claimed damages by fluoride emissions from the AAC smelter. McGarvey said recent actions by the Montana Board of Health were hurting the efforts of local residents to strike deals with large industries to clean up the environment. "I don't carry a brief for Anaconda," he said. "I'm for the environment." McGarvey said the health board had undercut an earlier anti-pollution agreement between the state and AAC, and that this kind of action could endanger other environmental efforts – large industrial companies would be reluctant to commit large sums of money to pollution control efforts if they had no guarantee that they could ever satisfy government requirements. McGarvey called for a new state law which would establish a procedure for creating binding agreements between residents, companies and the government to control pollution. "Otherwise, in future cases you won't be able to get the companies to move off square one," he said. "It's a serious problem, and it's got to be resolved." McGarvey believed such a system would also appeal to the EPA in federal pollution cases. [76]

On Feb. 4, 1981, Rep. Gary Bennett of Flathead County introduced two pollution control bills in the Montana Legislature relating to the Columbia Falls smelter. The first bill would limit the state standard to less than the federal standard. The second bill dealt with fluoride found in forage grasses. One of Bennett's bills would raise the state standard for fluoride emissions by aluminum smelters from 864 pounds per day to 933 pounds. The state standard for operating aluminum plants was stricter than both the state and federal standards for new plants. Additional air pollution bills were introduced by other state representatives. Rumors that the smelter might be closed prompted the new bills. [77] On Feb. 20,

during a meeting in Helena, the Montana Board of Health indefinitely suspended a new state standard on fluoride found in vegetation. MDHES representatives reported that the AAC plant probably could not comply with the new standards and recommended raising the new 20 ppm standard to between 35 ppm and 50 ppm. The department asked for nine months to perform new studies and to recommend new fluoride limits. Jack Canavan, AAC's public affairs manager, commented after the hearing, "They'll have to go through the rule-making process again. That means more public hearings and more input." [78]

By the end of March 1980, Bennett's bills were passed by both houses and sent on to Gov. Ted Schwinden. One bill established that fluoride emission standards for existing aluminum plants would be the same as for new plants. It was believed the bill would have clear sailing through the governor's mansion despite a minor disagreement over the location of a comma in the second bill. [79] The first bill, House Joint Resolution 22, stated that an existing aluminum reduction plant did not have to abide by the stricter standards of newer plants. The state standard for new plants had been the same as the federal standard, which was more lenient than the older standard used at the AAC plant. With passage of the new bills, the fluoride emissions standard at the AAC smelter was raised from 864 pounds per day to 930 pounds or, for short periods, as high as 1,100 pounds. The second bill, House Resolution 642, dealt with the ambient fluoride standard. Under the new bill, the monitoring methodology for ambient levels of fluoride would be simplified, saving both the government and AAC money for monitoring. The ambient standards would be measured by fluoride content in forage, grasses, hay and silage, which already had been set at 35 ppm during the growing season and 50 ppm for the rest of the year. Both bills reportedly gave the AAC plant more flexibility in operation. [80] The new standards would go into effect at the start of grazing season for domestic animals in spring 1982, according to a ruling by the Montana Board of Health. [81]

The post-conversion tale

Fluoride emissions at the AAC plant from January 1981 through June 1981 averaged between 500 and 700 pounds per day. Emission levels typically increased in hot summer months as convection currents carried gases and particulates up through the clamshell vents along the rooflines of the pot rooms, and plant personnel were interested in seeing how the plant fared during the first summer since the Sumitomo conversion had been completed throughout the plant. Another factor which helped to reduce total fluoride emissions was a small production curtailment, with a number of pots out of service. [82] In April 1981, BioWest, a consulting firm working for AAC, planted 6,084 evergreen seedlings to test the effects of fluoride emissions. Two plots were established within several hundred yards of the potrooms, and a third was planted a mile away up the North Fork of the Flathead River. One of BioWest's scientists, Mike Britton, had worked under contract with AAC since 1970, providing scientific information to help the company contend with environmental litigation. Britton and his partner, Geoff Harvey, both plant pathologists, were also conducting a long-term study to see how fluoride emissions impacted trees and other vegetation on AAC property in light of the recent modernization efforts at the plant. The study was expected to last 10 years. [83]

On Feb. 4, 1982, the U.S. House Subcommittee on National Parks held the first of three days of hearings on the state of the nation's parks, with a special focus on Glacier and Yellowstone national parks. A

representative from the Flathead River Basin Study was scheduled to appear, but AAC was unable to send a representative. Rep. Pat Williams, a member of the subcommittee, said he had hoped AAC would send someone to explain how the plant's new emission control equipment would prevent further fluoride damage to vegetation and wildlife in Glacier National Park. [84] The new air pollution equipment was reportedly doing its job. From late August 1982 through early October 1982, fluoride emissions at the smelter in Columbia Falls averaged 1.85 pounds per ton of aluminum produced, well below the state standard of 2.6 pounds and equivalent to 561 total pounds per day. The plant was operating at only 60% capacity. Beginning in October, AAC planned to begin a two-year test of second generation Sumitomo technology in 20 reduction pots to further improve energy efficiency and metal purity and increase the life of reduction pots. [85]

Over the next two decades, the aluminum plant received air pollution operating permits for support facilities inside and outside the potlines buildings, including raw materials handling equipment and the carbon paste plant. In 1981, AAC received permits for baghouses at its two alumina unloaders and a baghouse for its coke and coal unloader station. In 1982, AAC received a permit for a new aluminum casting facility that was never built and a permit for a temporary alumina storage and unloading facility that was used for other purposes at a later date. In 1983, AAC received a permit for new baghouses at the west alumina unloader and the coke and coal distribution facility, and for the Draco dust control system to control petroleum coke particulate emissions in the paste plant. [86]

In 1989, after the company had changed ownership and become the Columbia Falls Aluminum Co., the plant received a permit for a wet scrubber to handle coal tar pitch emissions in the paste plant. In 1990, CFAC received a permit for a baghouse at its Treatment of Aluminum Crucibles system, where tapping and hot metal crucibles were refurbished. In 1996, CFAC received a permit to convert baghouses in both alumina unloaders from shaker type to air pulse and a permit to modify the existing paste plant dust control system, which was later withdrawn. CFAC followed up with another permit for construction of a dry scrubber to control pitch-fume emissions at the paste plant as required by federal law. The new dry scrubber system used a venturi reactor injected with dry coke that binded with the pitch fumes and was then collected in a pulse-jet baghouse. The reacted coke was then re-used in the paste plant to make anode briquettes. The dry scrubber system installation was required under the National Emission Standards for Hazardous Air Pollutants for Primary Aluminum Smelters as a way to control the emissions of particulates and polycyclic organic matter. In 1997, CFAC received authorization for a new pin-cleaning machine that included a new cartridge-filter air cleaner. [87]

The plant's Montana air pollution permits were transferred to Glencore AG in 1999 when the Swiss company bought the smelter. CFAC personnel conducted regular testing for fluorides and polycyclic organic matter (POM) to comply with new Maximum Achievable Control Technology regulations. The MACT compliance date was Oct. 7, 1999, and the first MACT compliance report was received by the state on Feb. 11, 2000. The report indicated that the smelter was in fluoride compliance based on the five-potline average, but that three of the plant's potlines were not in compliance with polycyclic organic matter limits. CFAC had been unable to demonstrate compliance with either a single-potline POM emission limit or the five-potline POM emission limit through January 2001, when the plant suspended operations during the West Coast Energy Crisis. CFAC personnel and contractors analyzed

the problem but were unable to conclusively prove the source of the POMs, which typically were created by the heating of carbon paste in the Soderberg anodes. Once the plant was restarted after the 2001 shut-down, it would be required to show that it could comply with the POM requirements within 180 days, the state permit stated. CFAC was also required to come up with a plan to resolve their POM compliance issues. The Montana Department of Environmental Quality noted that the EPA set POM emission limits and would have a hand in establishing a compliance schedule. [88]

On July 25, 1991, on the anniversary of the city's centennial, the Hungry Horse News interviewed several Columbia Falls residents about the city's future. "Teakettle Mountain will have trees on it, and Columbia Mountain will still look as green as ever. Columbia Falls will still be the industrial center of the valley," Charlie Grenier predicted. "Hopefully we will see a growth in industry of some kind. That all streets will be surfaced for a cleaner city," Barbara Wirkus said. Others predicted that the local economy would change, with heavy industry being replaced by small, specialized industry or by tourism. [89]

By September 1994, CFAC personnel continued to monitor the impacts of fluoride emissions on plant life in Glacier Park by collecting samples in the Park once a month. The state Air Quality Bureau collected samples every 12 days at three locations closer to the smelter. Samples had been tested in CFAC's lab but now were being sent to a lab in New York. Fluoride levels in plant samples could not exceed 35 ppm or 50 ppm on a monthly average. Tests conducted by CFAC staff typically showed that ponderosa, lodgepole, grass and forage samples contained about 15 ppm to 20 ppm, well below the state limits for fluoride in forage, according to Ty Wilson, CFAC's quality control coordinator, who collected samples with Patty Perigo, the lab's senior chemist. The company claimed that pollution control equipment during the big conversion recovered about 99.9% of the fluoride emissions. [90]

By 2002, a short history of fluoride pollution in the Park was posted on the Glacier National Park website in a special section titled "Fluoride" that included photographs of impacts on park vegetation, animals and soils from fluoride emissions from the aluminum smelter in Columbia Falls. According to the website, the Park began monitoring fluorides in the Park in 1970 and proved high levels of fluoride had accumulated in plants, animals and soils. Damage to plants was documented in 1971 through 1978, and a lawsuit was filed by the Justice Department against ARCO in 1978 on behalf of the Flathead National Forest and the Park, the website said. The lawsuit was settled in June 1980, with ARCO paying $75,000 to the Forest Service. With a new dry scrubber system in place, fluoride emissions dropped significantly from 1980 through 1998. By 2002, the Park and the aluminum plant were cooperating in monitoring fluoride levels in ambient air on a daily basis as well as collecting forage and vegetation samples in May through September. According to a graph on the website showing pounds of fluoride emitted per day from 1957 through 1999, overall emissions had jumped from about 1,800 pounds per day in 1957 to about 3,000 in 1965, about 7,500 in 1968 and about 8,800 in 1969 before dropping to about 4,800 in 1970 and about 2,000 in 1973. There was a spike at about 4,100 pounds per day in 1978, during the Sumitomo conversion, followed by a gradual decline to less than 1,000 from 1980 through 1999. A spike in 1995 reached about 1,300 pounds per day of fluoride. [91]

Much had changed since efforts to control air pollution in Montana began in the early 1960s, culminating in the state's Clean Air Act in 1967. For the next few years, regulators and industries

debated about air quality standards, with the public generally supporting cleaner air more than unfettered industry. That consensus was clearly demonstrated during the state's constitutional conventions held in Helena in 1972. "The delegates brought none of the acrimony and bitterness to the Convention that sometimes develops between seasoned politicians with preconceived positions on major state issues," according to the official report published by the Montana Legislature and the convention's editing and publishing committee in 1979. The convention lasted 56 days, with the 100 delegates divided into committees. [92]

On March 22, 1972, members of the convention adopted a new state constitution, which was ratified by the voters on June 6, 1972. The preamble contained language showing an appreciation of the people for the state's natural beauty: "We the people of Montana grateful to God for the quiet beauty of our state, the grandeur of our mountains, the vastness of our rolling plains, and desiring to improve the quality of life, equality of opportunity and to secure the blessings of liberty for this and future generations do ordain and establish this constitution." This feeling continued in Article II Section 3, introducing the inalienable rights of its citizens: "All persons are born free and have certain inalienable rights. They include the right to a clean and healthful environment." Article IX dealt with the environment and natural resources and stated in Section 1: "The state and each person shall maintain and improve a clean and healthful environment in Montana for present and future generations." The Montana Legislature was directed to provide for administration and enforcement of these duties. [93]

On May 7, 1979, Gov. Thomas Judge signed into law a bill providing for a study of the health effects of air pollution on Montana citizens. The bill focused on air pollution in a select group of Montana cities, including Columbia Falls, Missoula, Billings, Butte-Anaconda, Hardin, Colstrip and East Helena. The study was to be completed by June 1981. [94] A review of the million-dollar Montana Air Pollution Study in 1978, however, concluded that the study was too ambitious and may have lost direction. One critic said the study had moved from providing Montana residents with practical information on whether air pollution was unhealthy to an academic investigation. Many of the critics were legislators who had originally wanted the study conducted. Some preliminary conclusions made by the study were considered dramatic, but the study's leaders had wanted more information for statistical accuracy. The legislature had commissioned the study to look at increased cancer deaths in Silver Bow, Deer Lodge and Lake counties, but as the study gained political support, the legislature added the Colstrip-Hardin, Missoula, Butte, Anaconda, East Helena and Columbia Falls areas. The study group began working without a hypothesis about how air quality and lung damage might be linked, which would have helped focus the study, critics said. And while the study's research areas expanded, the number of areas where data actually was collected shrank – at the time of the newspaper report, the study recommended no health testing be conducted in the East Helena, Colstrip-Hardin or Columbia Falls areas. [95]

As environmental protection increasingly moved into the hands of scientists and government regulators, the language became more technical and complex, leaving many in the public confused or clueless. This situation often worked well for industries that employed lobbyists, lawyers and scientists to adjust environmental regulations to suit company needs. But a random telephone poll conducted from Jan. 20 through Jan. 24, 2000, indicated support for clean air and water continued among the public. When 600 Montana residents were asked to rank the importance of certain values, clean air and water was

considered nearly as important as education, health care and taxes. The survey was conducted for the Montana Conservation Voters Education Fund by the polling firm of Fairbank, Maslin, Maulin & Associates and had a margin of error of plus or minus 4%. On a scale of 0 to 10 where 10 ranked important, clean air and water had an average rating of 6.9 compared with 7.1 for education, 7 for health care and 6.8 for taxes. About 57% of those polled viewed environmental issues important enough to affect how they would vote, about 70% said it was possible to have a clean environment and a strong economy, while 25% said that was not possible and a choice was needed between the two. [96]

With the air pollution problem in Columbia Falls mostly settled, the aluminum plant faced other serious issues over next three decades – three changes of ownership, the threat of closure as the rest of Anaconda's mining and metal processing facilities shut down, uncertainty over power supply and prices, and the demoralization of plant workers by a profit-sharing lawsuit caused by individual greed at the top. Ownership changes and power supply issues were a common theme in the history of aluminum smelters across the globe, but the profit-sharing lawsuit was an anomaly. What followed resolution of the profit-sharing lawsuit was the acquisition of the smelter by a huge global commodities firm with a notorious back story and the conversion of the aging smelter facility into a swing-plant with an uncertain future. By 2009, more than half a century after the smelter's pots were first energized, the Columbia Falls plant shut down for good and the facility headed for demolition and Superfund status.

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