ILLINOIS POLLUTION CONTROL BOARD
September 1, 1994

IN THE MATTER OF:	)	
	)	
PETITION OF GENERAL MOTORS CORPORATION	)	R93-13
TO AMEND 35 ILL. ADM. CODE 303.322	)	(Site-Specific
(Site-Specific Regulation for Fluoride)	)	Rulemaking)

Proposed Rule. First Notice.

OPINION AND ORDER OF THE BOARD (by E. Dunham):

This matter comes before the Board on the June 23, 1993 proposal of General Motors Corporation (GM) for site-specific relief from Section 303.322 (35 Ill. Adm. Code 303.322). On November 11, 1993, GM filed a stay in this matter. The Board granted this motion on November 18, 1993. The stay was lifted on February 3, 1994.

The Board's responsibility in this matter arises from the Environmental Protection Act (Act). (415 ILCS 5/1 *et seq.* (1992).) The Board is charged therein to "determine, define, and implement the environmental control standards applicable in the state of Illinois." (415 ILCS 5/5(b) (1992).) More generally, the Board's rulemaking charge is based on the system of checks and balances integral to the Illinois environmental governance: the Board bears responsibility for the rulemaking and principal adjudicatory functions; while the Illinois Environmental Protection Agency (Agency) has primary responsibility for administration of the Act and the Board's regulations. The latter includes administering today's new regulation.

GM is seeking to modify 35 Ill. Adm. Code 303.322, which was adopted in R78-7 on September 24, 1981, and established a site-specific water quality standard for fluoride in the unnamed tributary of the Vermilion River and the Vermilion River from the juncture of the unnamed tributary to the Indiana border. (Pet. at 1.) GM seeks to increase the fluoride water quality standard for the unnamed tributary and the Vermilion River from the juncture of the unnamed tributary to a point 0.9 miles downstream of that juncture from 5 mg/l to 10 mg/l. (Pet. at 2.)

A hearing in this matter was held on April 26, 1994, in Danville, Illinois before hearing officer Musette Vogel. At the hearing, GM presented three witnesses. Mr. Jim Schifo, Environmental Manager of GM, described GM's operations, the wastewater treatment system and efforts by GM to control the fluoride discharge. Mr. Schifo also presented the costs for non-treatment options for compliance and presented statistical support for the 10 mg/l standard. Mr. James Etzel, testified on the prior rulemaking in R78-7 and the costs of various treatment options. Mr. Greg Bright testified on the studies he performed

on the environmental impact of fluoride in the unnamed tributary. No members of the public attended the hearing.

GM filed a post-hearing brief on May 25, 1994. The Illinois Environmental Protection Agency (Agency) filed a post-hearing brief on June 8, 1994. The Agency has no objection to GM's petition.

BACKGROUND

GM's foundry is located in a rural industrial area between Danville and the Village of Tilton. (Pet. at 3.) The facility covers approximately 323 acres. (Tr. at 11.) The foundry manufactures ductile and grey iron castings for the automotive industries. (Pet. at 3.) The Danville Plant produces 800 tons (or 187,000 castings) of grey-iron, nodular iron and hi-carbon iron castings each day. (Tr. at 13.) The unit processes include cupola melting, sand molding, rough finishing and annealing of castings that are used in the production of intake manifolds, transmission parts and brake parts. (Pet. at 3.) The foundry employs more than 1,000 persons and contributes $80 million to the Danville area economy. (Pet. at 2.) GM plans to idle the plant during the 1996 calendar year. (Tr. at 13.) GM intends to continue operating the foundry at reduced volumes in the meantime. (Tr. at 13.)

The facility draws its make-up water for cooling purposes from the Vermilion River. (Pet. at 3.) Approximately 10.4 million gallons of water are used at the plant each day. (Tr. at 19.) The two major sources of wastewater are the cupolas and the dust collectors. (Tr. at 19.) Secondary sources of wastewater include noncontact cooling water and storm runoff water. (Tr. at 19.) Wastewater is treated and recycled through the system. (Tr. at 23.) The facility discharges 400,000 to 750,000 gpd wastewater including process wastewater and non-contact cooling water. (Pet. at 3.) The facility discharges to an unnamed ditch which flows approximately 4,250 feet to the Vermilion River. (Pet. at 7.)

The primary source of fluoride in the discharge is from the cupola emission control system due to the limestone flux. (Tr. at 31.) Increased recycling rates impact the levels of fluoride in the discharge. (Tr. at 28.) Fluoride discharge decreased after 1978 but increased after 1990. (Tr. at 31.) The increased wastewater recycle rate has increased the mass of fluoride discharged by 78.37 percent as compared to 1978 levels. (Tr. at 31.) The limestone is considered to be the major contributor to the fluoride levels in the plant water system. (Tr. at 39.)

In 1977, GM was issued an NPDES permit. (Tr. at 24.) GM's current NPDES permit, issued on June 23, 1991, is currently under appeal before the Board. (See PCB 91-219.)

ENVIRONMENTAL IMPACT

The stream's small water shed includes industrial, residential and forested areas. (Tr. at 70.) The total slope of the stream is quite steep resulting in several short waterfalls over bedrock in some areas. (Tr. at 71.) Streams of this type have a limited habitat for supporting diverse fish and benthic invertebrate communities. (Tr. at 71.)

Studies of the stream demonstrate that fluoride is not a limiting factor on the aquatic life and the habitat structure is the principal limit to achieving a more balanced aquatic community. (Pet. at 7.) Studies show that there is no indication that fluoride or other "toxic substances" in the wastewater discharge contribute to the impaired condition of the stream. (Tr. at 75.) In addition, a recent review of the literature showed that increasing the fluoride limits to 10 mg/l would have no adverse impact on the fish or macroinvertebrates in the ditch. (Pet. at 8.)

Studies of the stream show that the aquatic community of the receiving stream has improved since the studies done in the 1970s. (Tr. at 75.) Density and diversity of the aquatic life has increased and relatively pollution-intolerant forms now predominate. (Tr. at 75.) The warm water community present in the unnamed tributary and the Vermilion River are somewhat less sensitive to elevated fluoride levels than cold water communities. (Tr. at 77.)

GM contends that the increase in fluoride will not adversely effect humans. Fluoride is not a living pathogen, therefore, it should have no effect on the use of the water body for human recreation. (Tr. at 78.) The receiving stream is too small to be used as a source of potable water. (Tr. at 78.) The Vermilion river is not presently used for potable water nor is any such use planned. (Tr. at 78.) Further, the proposed concentration would not preclude the use of this as a source of potable water. (Tr. at 78.)

TECHNICAL FEASIBILITY AND ECONOMIC REASONABLENESS

Alternatives for compliance include additional treatment for fluoride, discharging directly to the Vermilion River or using alternate sources of limestone. Many of the options considered were the same options reviewed in the R78-7 rulemaking which granted GM a site-specific fluoride level of 5 mg/l.

One option for compliance reviewed by GM for compliance was to discharge wastewater directly to the Vermilion River and obtain a mixing zone effluent limit. (Tr. at 45.) Due to the distance and the topography of the area installation of the drainage tile would be extremely expensive and difficult. (Tr. at

45.) This option would not decrease the quantity of fluoride discharged. (Tr. at 46.) Fluoride would be discharged directly to the Vermilion River rather than the unnamed tributary. (Tr. at 46.)

Another option is to obtain an alternate source of limestone with a lower fluoride content. GM currently uses 23,040 tons of limestone a year at a cost of $120,960. (Tr. at 46.) Limestone is currently obtained from a source six miles from the Danville facility. (Tr. at 46.) It is difficult to determine the exact amount of fluoride content in limestone since it is not distributed evenly throughout the material. (Tr. at 47.) Fluoride levels are not considered critical to most uses of limestone and therefore is not usually monitored. (Tr. at 47.) GM is aware of one quarry in Michigan that routinely monitors the fluoride levels in the limestone. (Tr. at 47.) Obtaining limestone from this source would increase GM's cost for limestone by $541,440 per year. (Tr. at 47.) Another potential source for low fluoride limestone is in Bloomington, Indiana. (Tr. at 47.) However, since the fluoride level is not routinely monitored at this quarry, it is not certain that the fluoride level will be consistently low and result in compliance. (Tr. at 47.)

Treatment of the wastewater using absorption on bone char, ion exchange with activated alumina and precipitation with high magnesium lime were also considered to reduce the fluoride level. (Tr. at 60.) However, none of these technologies could guarantee consistent compliance and the cost of each technology is extremely high. (Tr. at 60.) In addition, each technology would produce large volumes of sludge which would require disposal at additional costs and also result in an adverse effect on the environment. (Tr. at 60.)

Based on analysis of historical data, GM contends that a fluoride limit of 10 mg/l will allow for long term process and production variables. (Tr. at 52.)

SITE SPECIFICITY

Concerns have been voiced that the method of granting site specific rules in water cases has, in fact, granted relief from water quality standards for the stream, and not for the petitioner alone. The Board has attempted of late to remedy this by adding language that is intended to grant relief to the petitioner without granting relief to other potential discharges in the same stream segment. The Board does so here by naming General Motors and limiting excess flouride sources to their discharge alone.

CONCLUSION

The Board agrees that site-specific relief is appropriate, based on the record of this proceeding. Alternatives for compliance with the current site-specific standard of 5 mg/l are technically infeasible and economically unreasonable. The proposed standard of 10 mg/l will not have an adverse effect on the environment.

ORDER

The Board hereby directs the Clerk of the Board to cause publication of the following amendments in the Illinois Register for first notice:

TITLE 35: ENVIRONMENTAL PROTECTION
SUBTITLE C: WATER POLLUTION
CHAPTER I: POLLUTION CONTROL BOARD

PART 303
WATER USE DESIGNATIONS AND SITE SPECIFIC WATER QUALITY STANDARDS

SUBPART A: GENERAL PROVISIONS

Section
303.100 Scope and Applicability
303.101 Multiple Designations
303.102 Rulemaking Required

SUBPART B: NONSPECIFIC WATER USE DESIGNATIONS

Section
303.200 Scope and Applicability
303.201 General Use Waters
303.202 Public and Food Processing Water Supplies
303.203 Underground Waters
303.204 Secondary Contact and Indigenous Aquatic Life Waters

SUBPART C: SPECIFIC USE DESIGNATIONS AND SITE SPECIFIC WATER QUALITY STANDARDS

Section
303.300 Scope and Applicability
303.301 Organization
303.311 Ohio River Temperature
303.312 Waters Receiving Fluorspar Mine Drainage
303.321 Wabash River Temperature
303.322 Unnamed Tributary of the Vermilion River
303.323 Sugar Creek and Its Unnamed Tributary
303.331 Mississippi River North Temperature

SUBPART D: THERMAL DISCHARGES

AUTHORITY: Implementing Section 13 and authorized by Section 27 of the Environmental Protection Act (~~Ill. Rev. Stat. 1991, ch. 111 1/2, pars. 1013 and 1027~~415 ILCS 5/13 and 27 (1992)).

SOURCE: Filed with the Secretary of State January 1, 1978; amended at 2 Ill. Reg. 27, p. 221, effective July 5, 1978; amended at 3 Ill. Reg. 20, p. 95, effective May 17, 1979; amended at 5 Ill. Reg. 11592, effective October 19, 1981; codified at 6 Ill. Reg. 7818; amended at 6 Ill. Reg. 11161, effective September 7, 1982; amended at 7 Ill. Reg. 8111, effective June 23, 1983; amended in R87-27 at 12 Ill. Reg. 9917, effective May 27, 1988; amended in R87-2 at 13 Ill. Reg. 15649, effective September 22, 1989; amended in R87-36 at 14 Ill. Reg. 9460, effective May 31, 1990; amended in R86-14 at 14 Ill. Reg. 20724, effective December 18, 1990; amended in R89-14(C) at 16 Ill. Reg. 14684, effective September 10, 1992; amended in R92-17 at 18 Ill. Reg. at 2981 effective February 14, 1994; amended in ____ at ____ Ill. Reg. _____ effective _____

Section 303.322 Unnamed Tributary of the Vermilion River

The fluoride standard of Section 302.208 shall not apply to waters of the State which are located from the point of a discharge from General Motors Corporation to an unnamed tributary of the Vermilion River, said point being located 3900 feet south of the Vermilion River, 1900 feet north of I-74, at 40 < 6'35" north latitude and 87 < 69'52" west longitude, to the confluence of said unnamed tributary with the Vermilion River; and from there downstream to ~~its juncture with the Indiana state border~~ a point 0.9 river miles downstream of the juncture at the crossing of a Norfolk and Western Railroad Bridge. Fluoride levels in

such waters as caused by the General Motors Corporation discharge shall meet a water quality standard for fluoride (Storet Number 00950) of ~~5~~10 mg/1.

(Source: Amended at ____ Ill. Reg. _____, effective _____)

IT IS SO ORDERED.

I, Dorothy M. Gunn, Clerk of the Illinois Pollution Control Board, hereby certify that the above opinion and order was adopted on the 15 day of September, 1994, by a vote of 6-0.

Dorothy M. Gunn, Clerk
Illinois Pollution Control Board