

BEFORE THE ILLINOIS POLLUTION CONTROL BOARD

RECEIVED
CLERK'S OFFICE

IN THE MATTER OF:)
)
REVISIONS TO RADIUM WATER QUALITY)
STANDARDS: PROPOSED NEW 35 ILL.)
ADM. CODE 302.307 AND AMENDMENTS)
TO 35 ILL. ADM. CODE 302.207 AND 302.525)
)

R 04-21

(Rulemaking-Water)

APR 26 2004

STATE OF ILLINOIS
Pollution Control Board

NOTICE OF FILING

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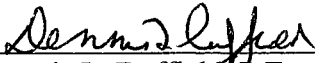
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PLEASE TAKE NOTICE that I have today filed with the Office of the Clerk of the Pollution Control Board the **PRE-FILED TESTIMONY OF DENNIS L. DUFFIELD, P.E.** on behalf of the City of Joliet, a copy of which is herewith served upon you.

CITY OF JOLIET

By: 
Dennis L. Duffield, P.E.
City of Joliet
Director of Public Works and Utilities

DATED: April 22, 2004
City of Joliet
921 E. Washington Street
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THIS FILING IS SUBMITTED ON RECYCLED PAPER

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Pollution Control Board

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PRE-FILED TESTIMONY OF DENNIS DUFFIELD

My name is Dennis Duffield. I am the Director of Public Works and Utilities for the City of Joliet. I am responsible for the planning, design, construction and operations of water and wastewater systems for Joliet. I have worked for the City of Joliet for approximately 24 years and have been responsible for the water and wastewater systems for all but the first four months of the 24 years. Prior to working at the City of Joliet, I worked for the City of Virginia Beach, Virginia for approximately five years with responsibilities for the operations of the water distribution and wastewater collection systems. Previous experience was in the Indian Health Program of the United States Public Health Service. I received a Bachelor of Science in Civil Engineering from Bradley University in 1972. I have been a Licensed Professional Engineer in the State of Illinois since 1980.

Today I will testify in regards to the Illinois Environmental Protection Agency's (IEPA) proposed changes to the water quality standards for radium and the impact of this proposal on the water supplies and wastewater treatment plants.

The City of Joliet operates a public water supply using groundwater containing radium. After use by consumers, the water is discharged to the two wastewater treatment plants that the City of Joliet also operates. Discharge from the plants is to Hickory Creek at the confluence with the DesPlaines River and directly to the DesPlaines River.

The City of Joliet's water supply system currently consists of 15 deep wells that produce water that exceeds the drinking water standard for combined radium 226 and radium 228 of 5.0 pico-curies per liter and 5 shallow wells that produce water that complies with the standard. This water is currently supplied to consumers without treatment. The wastewater from the community is collected and transported to two wastewater treatment plants. Since no radium treatment is provided, the radium that enters the system arrives at the wastewater treatment plants.

Joliet recently measured the concentration of radium in the influent to the treatment plants. The results are as follows:

Joliet Eastside Wastewater Treatment Plant

Date	Radium 226 pCi/liter	Radium 228 pCi/liter	Combined Radium 226 and 228, pCi/liter
February 2004	3.0	5.3	8.3
March 8, 2004	1.9	4.3	6.2

Joliet Westside Wastewater Treatment Plant

Date	Radium 226 pCi/liter	Radium 228 pCi/liter	Combined Radium 226 and 228 pCi/liter
February 2004	2.9	5.1	8.0
March 8, 2004	3.9	6.1	10.0

These concentrations of radium arriving at the wastewater plants are very near to the 10.4 pico-curies per liter average concentration measured in Joliet's deep wells.

Joliet is planning to remove radium from the drinking water by implementing the co-precipitation of radium with pre-formed hydrous manganese oxide. In this process, a solution of hydrous manganese oxide is mixed with the well water and forms a precipitate. The radium is attached to the precipitate. The precipitate is filtered from the water which removes the radium.

The filters collect the precipitate and begin to filter water at a slower rate. The flow of water is then reversed and the precipitate is washed from the filter and collected. This stream is known as the “backwash”. This wastewater from the water treatment process is then discharged to the sanitary sewer. This wastewater contains the radium removed from the drinking water.

The backwash combines with discharge from homes and businesses in the sanitary sewer and becomes the influent to the wastewater treatment plants. Since the radium is removed and subsequently recombined, there is no change in the quantity of radium anticipated to arrive at the wastewater treatment plants.

Measurements of the concentration of radium discharged from the wastewater treatment plants were also taken. The results of the measurements are as follows:

Joliet Eastside Wastewater Treatment Plant

Date	Radium 226 pCi/liter	Radium 228 pCi/liter	Combined Radium 226 and 228, pCi/liter
February 2004	1.2	3.9	5.1
March 8, 2004	2.6	3.5	6.1

Joliet Westside Wastewater Treatment Plant

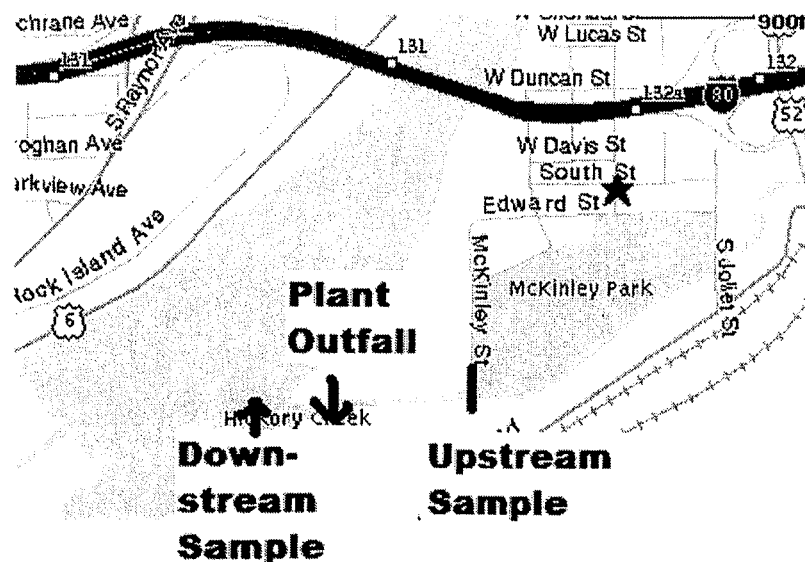
Date	Radium 226 pCi/liter	Radium 228 pCi/liter	Combined Radium 226 and 228 pCi/liter
February 2004	2.0	2.9	4.9
March 8, 2004	0.9	1.0	1.9

All of the discharge results demonstrate that this proposed rule is necessary to allow the continued discharge from existing wastewater treatment plants. The concentration of radium in the treatment plant discharge is reduced from the influent concentration. From this limited information, the range of the removal for combined radium 226 and 228 is from 2% to 81%.

The discharge from the Joliet Eastside Wastewater Treatment Plant is to Hickory Creek at the confluence with the DesPlaines River. Joliet collected stream samples from a location upstream of the plant discharge on Hickory Creek and a location downstream of the plant discharge on the DesPlaines River submitted for radium concentration determinations. The results of samples collected March 8, 2004 are as follows:

Location	Radium 226 pCi/liter	Radium 228 pCi/liter	Combined Radium 226 and 228 pCi/liter
Upstream	<0.1	1.3	1.3
Downstream	0.2	1.2	1.4

The specific sampling locations are shown on the map below:



These sample results show the impact of the discharge on the river is very limited.

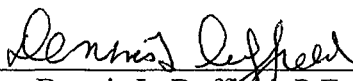
Joliet has collected additional influent and effluent samples and is waiting for the laboratory results. It is our intent to provide this information if it becomes available before the hearing record is closed.

The proposed rule is necessary to allow the water supplies to proceed with construction of the required facilities to remove radium from the drinking water and to be assured that the discharge of the backwash or other return flows from the radium removal treatment system can be discharged to the sanitary sewer without causing an effluent violation for the wastewater treatment plant owner. This will also allow the wastewater treatment plant owner to be assured that it will not be necessary to develop additional standards for the discharge of water treatment wastes containing radium to the sanitary sewer system. Joliet currently prohibits the discharge of any radioactive wastes of such concentrations that will cause the treatment plant to violate any water quality standards. Without the approval of the IEPA's proposed rule, Joliet would have to consider other water treatment methods that do not discharge the water treatment waste stream containing the radium to the sanitary sewers. This would be required as the discharge of radium bearing wastes to the sanitary sewers could result in a violation of the existing water quality standards.

As indicated in the testimony of Robert Mosher at the April 1, 2004 hearing, the only threat to human health from radium is through ingesting the radium through drinking water. The IEPA's proposed water quality standards adequately address any potential problems with food processing and public water supply intakes and allow the continuation of discharges by wastewater treatment facilities.

The City of Joliet supports the implementation of the water quality standards for radium.

I would like to thank the Board for the opportunity to submit pre-filed testimony. I will be pleased to answer any additional questions presented by the Board or members of the public regarding my testimony.

By: 
Dennis L. Duffield, P.E.
City of Joliet
Director of Public Works and Utilities

April 22, 2004

City of Joliet
Department of Public Works and Utilities
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