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U. S. Army Corps of Engineers  
Buffalo District  
FUSRAP Information Center  
1776 Niagara Street  
Buffalo, New York 14207

City of Tonawanda  
Board of Education  
202 Broad Street  
Tonawanda, New York 14150  
March 19, 1998

Dear Sirs:

The City of Tonawanda Public School District has three of its five schools less than one mile down wind (north-east) of the radon producing Niagara Landfill. These schools are the Tonawanda Senior High-Junior High School building, Fletcher Elementary, and Riverview Elementary. Currently these three buildings contain 1,952 students or 76% of the Tonawanda City School Districts population of 2,583 students (see attendance report.)

The concentration of cancer causing radon being vented at the Niagara Landfill flare is between 123 and 193 picocuries per liter as measured by the New York State Department of Environmental Conservation. This is 1,230 to 1,930 times greater than the regulator limit according to guidelines in Part 380 of New York State law "Rules and Regulations for Prevention and Control of Environmental Pollution by Radioactive Materials."

The Board of Education of the City of Tonawanda is concerned that air samples have not been tested for radon concentration downwind from the Niagara Landfill flare, that NYSDEC has not made any attempt to collect off site data, and that the NYSDEC has made any attempt to established, within accepted levels of scientific certainty, that the off site concentration of radon is less than the regulatory limit. Since the concentration of radon estimated by the NYSDEC modeling has not been validated by using the scientific method, the Board of Education of the City of Tonawanda is unwilling to place the children in our schools at further risk, and requests that the radioactive material in the Niagara Landfill be removed.

The Board of Education of the City of Tonawanda also requests that the proposed clean up level of the Niagara Landfill and the adjacent Ashland sites be in accordance with the United States Nuclear Regulatory Commission guidelines.

Specifically, the City of Tonawanda Board of Education's concerns regarding the proposed plan for clean up of the Ashland 1 site and Ashland 2 site are:

1. The City of Tonawanda Board of Education is concerned that the guideline for the removal of radioactive material from any FUSRAP site of 40 picocuries per gram of thorium is inadequate, and does not conform to the applicable U. S. Nuclear Regulatory Commission guideline of 5 picocuries per gram for all radioactive materials. Furthermore, the Board also takes the position that all radioactive materials be removed and not merely blended with non-radioactive material at a level of 5 picocuries per gram, as blending would further spread the spatial contamination.
2. The City of Tonawanda Board of Education is concerned that the radioactive material in the Niagara Landfill (on the Seaway property) is not being removed concurrently with the Ashland 1 and 2 properties. The City of Tonawanda Board of Education is opposed to segmentation of the review process and the proposed cleanup of radioactive material at only two of the three contiguous contaminated properties. The Niagara Landfill is the only site where capping will not contain the emission of deadly radon gas (see concern number 3). Radon gas, from the FUSRAP materials, is blown by the prevailing south-westerly winds over the City of Tonawanda. Since FUSRAP material was mixed with methane producing garbage in the Niagara Landfill (in violation of federal guidelines) and since methane from the garbage in the Niagara Landfill must be vented, the City of Tonawanda General Environmental Control Board has determined that the only way to prevent the radon emission is to remove the radium that is producing the radon gas.
3. The City of Tonawanda Board of Education is concerned that the New York State Department of Environmental Conservation's FACT SHEET "Niagara Landfill Update - Sampling of Landfill Gas For Radon" (see attachment #1) contains conclusions that are not

facts and can **not** be supported statistically, by New York State Department of Environmental Conservation data nor any other data.

Most of the conclusions in the NYSDEC Fact Sheet are not facts, and these conclusions are **not supported by NYSDEC data that is reliable, according to generally accepted scientific standards of confidence** (that is 99%, 95% or even 90% confidence levels). One of their conclusions: "... the concentration [of the radon] has not increased since the flare went into operation" is untrue at better than a 99.7% confidence level (i.e. a probability of 359 out of 360 chances.) There is only one chance in 360 that the statement is true (see probability analysis, attachment #2). Since activating the pumps greatly increases the flow rate, the radon will have less time to decay and be of a higher concentration.

The City of Tonawanda Board of Education is particularly concerned that the following statements in the NYSDEC FACT SHEET can **not** be proven according to generally accepted scientific standards of confidence:

(A) "the NYSDEC found that the gas does not contain concentrations [175 to 194 picocuries] of radon higher than should be expected from any landfill." This statement is not true. The concentration of radon in the Niagara Landfill is higher than any other landfill the NYSDEC has measured in New York State and even higher than the radon concentration in natural gas underground storage (documentation available upon request).

(B) "...the flare also has the effect of reducing the concentration of the radon. This is because ... the air and the gas expand when they are heated." Since the heated radon soon cools to ambient temperature, which is well below the original temperature of the radon as it enters the flare, the net temperature change is one of cooling. The effect of this net cooling causes the gas to contract and causes the concentration of the radon to increase, and does not have the effect of reducing the concentration of radon as stated by the NYSDEC when expansion or contraction due only temperature change is considered. The threat of the radon to humans will be at the ambient temperature not at the flare temperature (1,680 °F), because no one resides in the flare.

(C) "Under the worst weather conditions, the model predicted that beyond about 55 yards, the concentration of the radon released through the flare stack would be less than the concentration of the natural radon in the air." This sentence brings up several questions. First, there is only one sentence between this and sentence (2). Together they give the reader the impression that due to the flare, radon levels are "less than the concentration of the natural radon in the air" at a distance of 55 yards. The truth is that the natural radon concentration when supplemented by the flare radon has to be higher than the background. Secondly, nowhere in the FACT SHEET is the radon concentration at a distance of seven yards addressed, which is the minimum distance of the flare from the property line. To determine the threat to the general public a distance of 55 yards is inappropriate. Thirdly, no measurements have been made downwind of the flare and there is no data to indicate that the use of the NYSDEC model is appropriate nor has there been any data that determines the model was properly employed.

(D) "Therefore NYSDEC and the New York State Department of Health still conclude that the radon emissions from the flare are not a significant hazard to the environment or the public." As with the other conclusions in the FACT SHEET "Niagara Landfill Update - Sampling of Landfill Gas For Radon" and the conclusions in the NYSDEC reports on the Niagara Landfill, there is no data collect that supports these conclusions using generally accepted scientific standards of confidence (that is 99%, 95% or even 90% confidence levels). Instead, NYSDEC chose to use conjecture and wishful thinking (rather than scientific objectivity) in formulating their conclusions. Their conclusions are not supported by using the scientific method, and even their conjectures are often not based on scientific principle.

Under the present system the NYSDEC Fact Sheet gives the public and governmental agencies a false sense of security that needlessly jeopardizes public safety in New York State.

4. The City of Tonawanda Board of Education is concerned that the NYSDEC does not have the authority to regulate the 11.e.(2) material (the federal Manhattan Project radioactive material) and does not have authority to approve the U. S. Army Corps of

Engineers proposed guidelines. The regulatory authority lies with the **United States Nuclear Regulatory Commission.**

Sincerely,

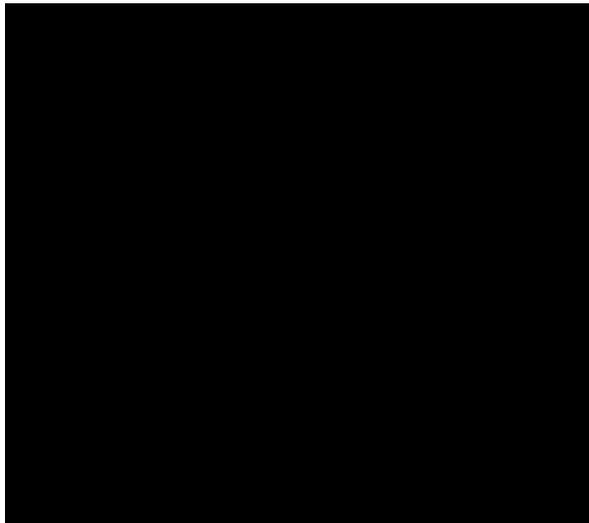


President  
City of Tonawanda  
Board of Education



Vice President

Members:



TONAWANDA CITY SCHOOL DISTRICT

BOE Meeting March 5, 1998  
Enc. 5.1

OFFICE OF PUPIL SERVICES

[REDACTED], DIRECTOR

202 BROAD STREET TONAWANDA, NEW YORK 14150-2098

(716) 694-7687  
FAX(716) 694-3925

TO: [REDACTED]  
FROM: [REDACTED]  
DATE: February 17, 1998  
RE: ATTENDANCE REPORT  
Period 4 12/01/97 to 12/26/97

FEB 17 1998

Please find attached hereto a summary report from Erie #1 BOCES with regard to pupil attendance at each building for the month of December, 1997.

On this page, I have provided a brief overview for quick reference.

	DECEMBER 1997	
	ENROLLMENT	ATTENDANCE
Tonawanda Senior High School	785	91.24%
Tonawanda Junior High School	432	94.09%
Fletcher Elementary	421	95.84%
Highland Elementary	269	96.54%
Mullen Elementary	362	95.87%
Riverview Elementary	314	95.59%
Opening Enrollment	2,570	
District Total/Average	2,583	94.20%
Year to Date	+13	95.35%

JPT/nh  
ENC

NEW YORK STATE  
DEPARTMENT OFENVIRONMENTAL  
CONSERVATION

Dear Interested Citizen:

The New York State Department of Environmental Conservation would like to brief you on the current status of the Niagara Landfill and the results of the most recent testing for radon - 222. If you would like more information about the landfill or the testing, please contact:

Ms. Barbara Youngberg  
Project Manager  
NYSDEC, Room 402  
50 Wolf Road  
Albany, NY 12233-7255  
(518) 457-2225

or

Mr. Michael Podd  
Public Affairs  
NYSDEC Region 9  
270 Michigan Avenue  
Buffalo, N.Y. 14203-2999  
(716) 851-7220

For site related health questions, please contact the following New York State Department of Health (NYSDOH) representatives at:

Mr. Robert Alibozek  
Bureau of Environmental  
Radiation Protection  
NYSDOH  
2 University Place  
Albany, NY 12203  
1-800-458-1158, Ext. 451

or

Ms. Charlene Thiemann  
Health Liaison Program  
NYSDOH  
2 University Place  
Albany, NY 12203-3399  
1 (800) 458-1158, Ext. 402

## FACT SHEET

NIAGARA LANDFILL UPDATE  
SAMPLING OF LANDFILL GAS FOR RADONRadon Analysis Of The Gas Extraction System  
June 1997

## INTRODUCTION

The New York State Department of Environmental Conservation (NYSDEC) completed further testing to measure the radon concentration in the landfill gas from the Niagara Landfill, located at 4825 River Road, Tonawanda, N.Y. The complete report of the tests is available from the NYSDEC's Bureau of Pesticides & Radiation and additional background information regarding the site is at the end of this Fact Sheet.

## THE RADON LANDFILL GAS TESTING PROGRAM

To ensure that the radon produced by the Formerly Utilized Sites Remedial Action Program (FUSRAP) waste was not significantly affecting the level of radon gas collected from the rest of the landfill, several wells were tested in February 1996, before the flare was put into operation. To assess the effect of the flare, NYSDEC planned to sample the gas every three months during the first year that the flare operated.

## RESULTS OF THE RADON LANDFILL GAS SAMPLING

On October 15 and 16, 1996, NYSDEC staff sampled the landfill gas in the pipeline to the flare and analyzed the samples for radon. As reported in November 1996, the NYSDEC found that the gas does not contain concentrations of radon higher than should be expected from any landfill. The radon concentration ranged from 175 to 194 picocuries per liter.

*The have not found any higher*

As scheduled, in January and April 1997, NYSDEC again sampled the landfill gas. The radon concentration in the January samples ranged from 160 to 175 picocuries per liter. There were two rounds of samples collected in April. The radon concentration in the first set of samples ranged from 84 to 139 picocuries per liter. Because all six of these sample results were lower than had been measured in either October 1996 or January 1997, NYSDEC collected a second set of samples one week later to confirm the low results. The range in the second set of samples was 126 to 157 picocuries per liter.

These results are contributing to a more complete understanding of the variation in radon concentration over time in the landfill gas. We now know that the radon concentration changes over time, but the concentration has remained less than about 200 picocuries per liter, and the concentration has not increased since the flare went into operation.

BFI hired a consultant to analyze separate samples of landfill gas for radon. BFI's results were slightly higher than NYSDEC's, but still in the same range:

October 1996:	195 to 207 picocuries per liter
January 1997:	189 to 200 picocuries per liter
April 1997:	117 to 145 picocuries per liter.

*which ones*

## WHAT THESE RESULTS MEAN

The flare destroys air pollutants present in the landfill gas. While this is the purpose of the flare, the flare also has the effect of reducing the concentration of the radon. This is because air mixes with the landfill gas as it burns, and the air and the gas expand as they are heated.

*later contracts to a temp lower than 400°F*

In October 1996, NYSDEC used computer models to estimate the concentration of radon in air at various distances from the flare. Under the worst weather conditions, the models predicted that beyond about 55 yards, the concentration of the radon released through the flare stack would be less than the concentration of natural radon in the air. In addition, because the exhaust stack extends upward about 40 feet, the concentration of radon gas coming from the stack would be even lower at ground level.

*7 yds to flare*

NYSDEC also used a computer model to assess whether the general public could receive a

significant radiation dose from this radon. For the model, NYSDEC assumed the flare emission mixed only in the layer of air between ground level and an elevation of about 82 feet. Normally, the air mixes to heights of hundreds of yards. Therefore, this was a very conservative assumption. Under those extreme conditions, the model estimated that the highest radiation dose a person would receive from radon released through the flare would be about 0.01 millirem in one year -- or less than one ten-thousandth of the radiation dose people receive from natural background radiation.

The latest test results do not change these analyses. Therefore NYSDEC and the New York State Department of Health still conclude that the radon emissions from the flare are not a significant hazard to the environment or the public.

## THE NEXT STEP

As part of the NYSDEC's monitoring program, the Department will sample the landfill gas once again in July, 1997. Based on the results of all

the samples collected in the first year of flare operation, NYSDEC will determine the frequency of any future sampling.

## BACKGROUND

The Niagara Landfill stopped receiving municipal wastes in September 1993. Since that time, Browning Ferris Industries (BFI), the operator of the landfill, has worked to properly close the facility. One of the systems BFI had to install was a system to manage the gas produced as the solid waste decomposes.

Such a system is required because the gases which are produced by solid wastes can collect under the landfill's cap and damage it, or become an explosion hazard. This was done by installing a series of gas extraction wells, a collection system, blowers and a flare which burns combustible gases to destroy air pollutants.

The Niagara Landfill contains about 10 million

cubic yards of solid waste. It also contains about 117,000 cubic yards of soil that has an average concentration of radium-226 about five to ten times the concentration found naturally in most soils. That radium is a waste product from the Manhattan project during World War II. It resulted from the treating of uranium ore to remove the uranium.

The US Department of Energy administers the Formerly Utilized Sites Remedial Action Program (FUSRAP) to evaluate such sites and, if necessary, remediate the sites. Thus, the radioactive waste in the Niagara Landfill is commonly called the "FUSRAP waste." There are no gas extraction wells in the areas in the landfill that contain FUSRAP waste.

## FOR MORE INFORMATION

For more information about the testing, radon-222 or the site, please contact: Ms. Barbara Youngberg, Project Manager, NYSDEC, Room 402, 50 Wolf Road, Albany, NY 12233-7255; or call; (518) 457-2225. For site related health questions, please contact: Mr. Robert Alibozek, Bureau of Environmental Radiation Protection, New York State Department of Health, 2 University Place, Albany, NY 12203; or call: 1-800-458-1158, Ext. 451.

attachment #2

Flow Rate	Radon Concentration (pCi/l)	Date of collection
870	123	4/7/97
905	135	4/15/97
910	156	4/16/97
965	168	1/22/97
1200	184	10/16/96
1200	192	10/15/96

The NYSDEC FACT SHEET states in the last line of the third paragraph under *RESULT OF THE RADON LANDFILL GAS SAMPLING* "... the concentration [of the radon] has not increased since the flare went into operation."

The fact is just the opposite is true. The data clearly indicates that not only did the concentration of radon increase once the pump for the flare was turned on, but also that running the pump faster results in higher concentration of radon gas. This can be proven according to acceptable scientific standards of significance.

In the table above are all the flow rates (in increasing order) and the corresponding radon concentrations that the NYSDEC has published in all their reports.

If we assume that the NYSDEC is right and the concentration does not increase, and does not depend on the operation of the flare pump. The rate of the flow of the flare pump would not influence the concentration of radon.

So the lowest rate of flow would not necessarily result in the lowest radon concentration. The chance that it would randomly just happen to be the lowest would be 1 out of 6, because any of the six radon concentrations has as good a chance as any other radon concentration of being matched with the lowest rate of flow.

The second lowest rate of flow would not necessarily result in the lowest radon concentration remaining. The chance that it would randomly just happen to be the lowest would be 1 out of 5, because any of the 5 radon concentrations remaining has as good a chance as any other radon concentration of being matched with that lowest rate of flow.

The third lowest rate of flow would not necessarily result in the lowest radon concentration remaining. The chance that it would randomly just happen to be the lowest would be 1 out of 4, because any of the 4 radon concentrations remaining has as good a chance as any other radon concentration of being matched with that lowest rate of flow.

The fourth lowest rate of flow would not necessarily result in the lowest radon concentration remaining. The chance that it would randomly just happen to be the lowest would be 1 out of 3, because any of the 3 radon concentrations remaining has as good a chance as any other radon concentration of being matched with that lowest rate of flow.

The chance that all of these events could happen together is one out of  $6 \times 5 \times 4 \times 3$  ..... or one out of 360.

A few scientist accept a level of significance of one out of 20. Scientist in scientific fields that deal very high levels of precision accept a level of significance of one out of a hundred.

Clearly the data shows there is a direct relationship between the rate of flow and the concentration of radon gas, and that this relationship is significant according to acceptable scientific standards.

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**BOARD OF EDUCATION**  
TONAWANDA CITY SCHOOL DISTRICT  
202 BROAD STREET  
TONAWANDA, NY 14150-2098



**TO:**

US ARMY CORP OF ENGINEERS  
BUFFALO DISTRICT  
FUSRAP INFORMATION CENTER  
1776 NIAGARA ST  
BUFFALO NY 14207