From: [redacted]
To: [redacted]
Cc: [redacted]
Sent: Fri Oct 15 07:23:26 2010
Subject: Re: As Promised a Response TO An EPA Request to Again Consider a Recheck: IW...

[redacted],

Thank you for the response. I am not offended in any way by your October 7, 2010 email to me, so see no reason why anyone else should be offended on my behalf. I think it is more important to maintain an open and constructive dialogue, so I am copying all on my reply.

Could we please review what we do agree on and use this for further face to face discussion in November.

What is the EPA position on the following?

1) Ground water seasonally intrudes the interim waste containment structure IWCS.

2) In addition to uranium ore residues the IWCS contains nuclear reprocessing wastes generated by the Knolls Atomic Power Laboratory. This introduces the possibility of other radioactive groundwater contaminants, such as strontium-90 and technetium-99 showing up in the groundwater around the IWCS. The ability of the gray clay to retard these contaminants and contain then in the IWCS is unknown.

3) The effect of de-watering operations at Modern caused the lower water bearing zone (LWBZ) groundwater to reverse direction for several years, which resulted in Modern becoming down gradient of the IWCS (for the LWBZ). Modern therefore should not be used to establish groundwater background for the NFSS, since the LWBZ may have been previously impacted by the IWCS.

4) The steadily increasing levels of uranium in groundwater east of the IWCS are an indication of leakage from the south side of the IWCS into the upper water

bearing zone (UWBZ) groundwater. (I know EPA opinion on this, but would like to go over the data which distinguishes pre-existing contamination from IWCS leakage.)

5) There is an immediate, potential hazard to the off-site public because pathways exist (water lines and ditches) for IWCS leakage to rapidly move off site. The water lines, which were not included in the RI) may have already allowed contamination to move off site undetected.

Regards,
[redacted]

Dear [redacted]

This is in response to your October 1, 2010 email in which you expressed your disappointment in the contents of what I wrote therein. Before I continue, let me say I have purposely chosen to address this to you and you alone. While my responses will be frank and forthright they are not meant as an attack or to insult, however those unfamiliar with these issues may see things differently and as such I am limiting my audience on this to only you.

1. EPA did not disregard any data. I frankly am disappointed at your categorization and question why you would say this. As I have explained in both public forums and during a previous phone conversation with you EPA's goal is "Good Science." Good Science is not using bad data. Bad data is data generated without the proper quality control. When bad data is used in decision-making, bad decisions happen. The bad data used about safety systems on BP's Gulf Well, the bad data on "o-rings" on the Challenger, and the bad data on ceramic tiles on the Columbia all lead to bad decisions and people died. This will not happen on my watch. Please understand this. Your categorization that these unused data are a technicality is unfortunate and clearly not accurate. More troubling to me is your appearance of stating EPA policy on these data. You will remember, I am sureO-rings, when we met prior to the last Stakeholder meeting, I was very adamant with one of your colleagues that EPA and only EPA will state our Agency's policy. Let me summarize this again and be absolutely clear. EPA analyzed all of the data available. EPA has based its decisions on data that meets the data quality objectives of a Quality Assurance Project Plan. Data that is not quality assured is not good data and not usable for decision-making.
2. Your comment, "Having finally persuaded EPA to review IWCS monitoring data" is also most troubling to me. I believe the reasonable person who understands the time and attention the EPA Region 2 office has put into reviewing the work done by the USACE and its predecessor would speak differently to your opinion that you persuaded us to do any reviews. What you did persuade me to do, is to review your contentions, which in the case dealing with the IWCS, I discounted.
3. Your comments that the Feasibility Study is somehow dependent on the Remedial Investigation shows a misunderstanding of the entire CERCLA process from which the actions of FUSRAP are derived. Once the site has undergone remediation

it will be reviewed using the Multi-Agency Radiological Survey and Site Investigation Manual (MARSSIM) approach. http://www.EPA.gov/rpdweb00/marssim/ <http://www.epa.gov/rpdweb00/marssim/> . This process does not allow for radiological contamination to be left on a site that exceeds Federal Radiation Protection Standards. You may also wish to look at other cleanup guidance and procedures contained in: Multi-Agency Radiological Laboratory Analytical Protocols Manual (MARLAP) http://www.epa.gov/rpdweb00/marlap/ <http://www.epa.gov/rpdweb00/marlap/> ; and in Multi-Agency Radiation Survey and Assessment of Materials and Equipment Manual (MARSAME) http://www.epa.gov/rpdweb00/marssim/marsame.html <http://www.epa.gov/rpdweb00/marssim/marsame.html> .

4. EPA's review of the data is based on sound peer reviewed science and quality data and the same staff that participated in the development of the multi-agency documents referred to above are the ones who reviewed the data. We stand by our opinion that the FS needs to proceed, that enhanced environmental monitoring is desirable, and that the IWCS is performing adequately at containing the waste therein. On at least one of these points we appear to disagree.

5. EPA is moving on in this matter. Our next involvement will be to consult with the USACE in preparation of their November Stakeholder meeting.

We regret that you choose not to agree with our position on this matter but we are choosing to move forward. I believe we have been clear on our position and I would ask that you not try to re-categorize it, or to assert a position as being EPA's that is not.

Respectfully,

[redacted]

Radiation & Indoor Air Branch

[redacted]

Thank you for the detailed EPA response to my September 2, 2010 email, in which I requested a thorough EPA review of the available monitoring data for the Niagara Falls Storage Site (NFSS). Let me give a brief reply.

Having finally persuaded EPA to review IWCS monitoring data, I am disappointed that EPA is choosing to disregard the data on a technicality. The EPA position that all environmental monitoring data, as selected by EPA, indicates that the IWCS is performing as designed is meaningless and in keeping with the way in which IWCS leakage has been kept from the public in the past - if the data indicates IWCS problems, lose the data /discontinue the monitoring.

With regard to remediation, I fully support EPA focusing its NFSS remediation efforts on the Interim Waste Containment Structure, but believe future remediation is not best served by overlooking serious deficiencies identified in both NFSS surveillance monitoring and the Army Corps of Engineers (USACE) Remedial Investigation (RI). In planning remediation, we need to know how much contamination has leaked from the IWCS and where it has gone to. More importantly for the Lewiston Porter community, we need to identify any imminent health and safety hazards to a member of the public outside the site. The RI achieves neither, because leakage from the IWCS is being ignored and pathways for contamination to move off the NFSS have yet to be investigated.

I would respectfully request EPA give further thought to the following facts before endorsing a feasibility study based on a flawed RI and relying on inadequate environmental surveillance data, even if that data is covered by a quality assurance project plan. The available data shows the IWCS is not isolating the radioactive residues and the interaction with the surrounding groundwater has not been adequately investigated.

NFSS Environmental Monitoring/Surveillance Data

1) Lower Water Bearing Zone (LWBZ) groundwater monitoring
USACE has never monitored the LWBZ groundwater around the IWCS. There is no USACE monitoring data to review. In addition, USACE has yet to evaluate the effect on the IWCS of excessive de-watering operations at Modern, begun in 1991, which caused the LWBZ groundwater to reverse direction and flow east for several years, making Modern down gradient of the IWCS.
Note - USACE used Modern to establish groundwater background for the NFSS. This is not valid, given Modern's down gradient location with respect to the NFSS (LWBZ).

2) Upper Water Bearing Zone (UWBZ) groundwater monitoring
The extent and levels of uranium being detected in groundwater south of the IWCS indicate leakage from the IWCS not pre-existing contamination outside the IWCS. Well OW-11B continues to show significant increases in uranium - the level of uranium increased from 176 pCi/L in Fall 2008 to 274 pCi/L in Fall 2009. These levels of uranium are unprecedented in the 24 years of IWCS groundwater monitoring. Well OW-11B is down gradient of a 10" potable water line, potentially contaminated with IWCS leakage. The water line has not been investigated. At the June 10, 2010 public meeting, USACE justified the lack of investigation by stating the water lines are pressurized and encased in concrete. However,the 10" potable water line is abandoned, made of cast iron with no surrounding concrete and has a history of joint corrosion which would make it susceptible to groundwater infiltration.

Investigation of the water lines should be given a high priority because in planning remediation of the IWCS, it will be necessary to first determine the extent and nature of leakage from the IWCS.

IWCS Water Level Measurement Data
Performance monitoring reports for 1987 to 1991 show:
1) A sudden increase in water levels inside the IWCS immediately after closure.

2) Seasonal variation in water levels inside the IWCS. The water levels vary in the same way as the groundwater outside the IWCS - levels are highest in Spring and lowest in Fall.
3) Water collecting within the IWCS.
All of these results indicate that the IWCS is not functioning as intended and is not isolating the high level radioactive residues from the surrounding groundwater.

EPA may choose to disregard the data concerning water levels inside the IWCS but this data was considered key in evaluating the integrity of the IWCS. Focusing on radon measurements alone does not demonstrate IWCS integrity. The first step to dealing with a problem is to acknowledge that there is a problem.

[redacted]

In a message dated 9/24/2010 9:04:16 P.M. GMT Daylight Time, [redacted] writes:

Hello [redacted]:

I wanted to respond to your most recent email of September 2, 2010 in which you requested that the U.S. Environmental Protection Agency (EPA) do a thorough review of the various Niagara Falls Storage Site (NFSS) data sets. Before I provide our response, I want to thank you for all of the time and effort you have put forth in reviewing the available data and analyzing the situation at NFSS and in particular that involving the Interim Waste Containment Structure (IWCS).

Background

We also had a telephone conversation previous to your most recent emails where we covered several points. One of these points was the need to focus our efforts on the IWCS as a priority because of the quantity of radioactive material contained therein. Another point we discussed was the priority for getting a feasibility study for the site completed as soon as possible so that available funding could be applied to the site for a remedy, once one had been ultimately formulated. In this context, let me respond to your previous email.

EPA believes that it has done a thorough review of the NFSS data available. In our review we have relied most heavily on data for which a quality assurance project plan (QAPP) exists. When data has been supplied for which no QAPP was available we took note of that data, but consistent with EPA policy, we did not rely on it for decision-making.

Environmental Monitoring/Surveillance Data

Based on the environmental monitoring data available from the U.S. Army Corps of Engineers (USACE) and for which the data is covered by their QAPP, we find that all environmental monitoring data indicates that the IWCS is performing as it was designed and that it is currently containing the wastes contained therein. We note that well 11B has shown some increases in Uranium levels. We do not believe that this well is indicative of any leakage occurring from the

IWCS because of its location. It is located past other closer down gradient wells which do not exhibit similar increases and it is across the central drainage ditch. As such we would not consider the data from well 11B as an indicator for the integrity of the IWCS. We further believe that in all cases where anomalous reading in groundwater well monitoring data have been seen, it can be explained by radioactive contamination not contained within the IWCS. In short, these data give us no reason to believe that the IWCS has leaked or is currently leaking.

We agree that the various water mains on the NFSS site need further investigation to determine if they may contain radioactive contamination. In some cases these mains could also have created some contamination immediately adjacent to them when they were not encased in concrete or similarly protected. We have communicated this to the USACE as you are aware. We also do not believe that these water mains are a conduit for the leakage of radioactivity from the IWCS because they do not come in contact with the IWCS and there is no evidence of such a direct pathway. Notwithstanding, we have recommended that to the USACE that they evaluate all of the water lines for contamination and deal with them accordingly through the Feasibility Study (FS) process. I want to emphasize we do not believe the investigation of the water lines is a higher priority then a remedy for the IWCS. We believe these mains can be handled during the FS process and that the IWCS source is the priority for consideration and remediation. It is my understanding that the USACE concurs with our opinion on the water mains and their relative importance and will be dealing with them accordingly in the FS process.

IWCS Water Level Measurement Data

We have also endeavored to perform a thorough review of the IWCS water level data. In doing so, we have found this to be a difficult and very inconclusive effort. The data provided as part of the original work by Bechtel National Inc. (BNI) for the U.S. Department of Energy (DOE) does not appear to have any QAPP that either EPA or the USACE could obtain. We reviewed the apparent attempts to show the validity of the data by BNI and we are not convinced that the scheme was working in a manner that would provide meaningful data. We would also note that the historical record shows that the system was struck, not once, but twice, by lightning. EPA staff has concluded that the efforts in 1991 to correlate the transducer data are at best inconclusive and probably indicate the system was not working well enough to be useful. The USACE and EPA have tried to get the 1992 Performance Monitoring Report but have been unable to obtain it, if it in fact exists. The USACE is continuing its data collection process for this matter. We also note that from the time when the system was completed there were several operations done on the cover including irrigation, growing grass, etc. that could have affected the water levels in the trench, if they truly were varying. I have personally had frank conversations with my staff and while we may disagree that the data from the DOE’s trench water monitoring program is flawed because the system didn’t work correctly or the overall program didn’t sufficiently account for cap maintenance, we agree that the data is not usable for determining the current integrity of the IWCS. I have had similar frank conversations with the USACE and I would suggest they conclude similarly.

I want to also highlight a portion of the history of this site. For the period beginning in the mid 1980s through 1997 the DOE was responsible for the FUSRAP program and BNI was their contractor for this site. Beginning in 1998 Congress changed this and made the USACE responsible for the FUSRAP program. The USACE did not continue using BNI as a contractor. This has made it difficult for EPA to get information on activities such as the 1992 Performance Monitoring Report and other possible information sources that may shed more light on the trench water monitoring. We understand the USACE has also had similar difficulties. While it is not our place to comment on Congress' wisdom in transferring the FUSRAP program or the relative merits of one Federal agency over another, it appears that the transition has not been so smooth that all data and all reports are accounted for. The USACE has told me that they continue to pursue data sources especially from DOE's contractor and find themselves in the position that they may have to actually procure missing information. To the USACE's credit they are still pursuing this, but at this time we can categorize our knowledge of the data for the trench water monitoring as incomplete, inconclusive, and as such not suitable for decision-making. Based on this we have concluded that trench water monitoring data of the late 1980s and early 1990s, data that is more than 20 years old, does not indicate any leakage from the IWCS. We will reconsider this opinion if further data from that period becomes available. We have also suggested to the USACE that they should consider water level measurements in the IWCS if a suitable technology exists that would not compromise the integrity of the cap of the IWCS. I believe we discussed this when we met in June and you are aware of our concerns about penetrating the cap and releasing radon gas. Finally, the most recent radon measurement conducted by the USACE does confirm the integrity of the IWCS cap. As such we feel confident in discounting 20 year-old water level data taken from a system without an apparent QAPP.

Enhanced Environmental Monitoring

While we have concluded that the IWCS is containing the wastes we also have agreed with citizens who believe that enhanced environmental monitoring should be considered to assure an early warning system of any failure of the IWCS into the future. Again, as we discussed when we met in June, we have made several suggestions to the USACE concerning EPA's thoughts on enhanced monitoring. It is our understanding that the USACE is considering these suggestions and will be getting back to us before the next Stakeholder meeting in November.

CERCLA PROCESS: FS/Preferred Alternative/Record of Decision (ROD)

We have continued to suggest to the USACE that they execute an FS for the site with primary emphasis on the IWCS so that a preferred alternative can be formulated and when funding is available duly executed. We continue to suggest this be done without delay and that tasks involved in enhancing environmental monitoring and in further data collection be worked into the FS process to avoid delays in the ultimate goal of a preferred alternative. This would include the needed review of water mains and their remedy if and as necessary. We base these suggestions on the fact the data that is available and for which data quality has been assured, indicates there is no current threat to the surrounding population at this time. The current monitoring when enhanced can provide adequate assurance that public health and the environment can be protected in a time frame

consistent with the development of an FS, a preferred alternative and a Record of Decision (ROD). We do, however, note that annual funding for the FUSRAP program has been about $130 million per year. This is for all FUSRAP sites nationwide which the USACE must address. The most recent estimate for remedying this site was done by the DOE quite a while ago and estimated the cost to be between $500 million and $1 billion. Simply adjusting for inflation and advances in technology would imply that going forward, this figure is now low. As such, if current funding levels were to be maintained and could all be applied to this site, the actual remedial work would last perhaps a decade or longer. Historically it has been difficult to assure adequate disposal capacity for wastes as highly radioactive as these for that length of time into the future. It is with this in mind that EPA believes it is time to go forward as soon as possible in formulating the necessary tools to get this site into active remediation. Given the finite resources available and the time frames involved, we believe that interrupting the current FS process, with further remedial investigations which are unlikely to show any potential public health and environmental consequences, is unwarranted.

Looking Forward

EPA plans to attend the next USACE Stakeholder meeting in early November. We understand that the DOE is also planning on attending that meeting. Further, we understand from your colleagues Dr. Joseph Gardella and Dr. William Boeck, that the USACE and your core of involved citizens are working to further enhance technical citizen input into the FS process through a facilitator. EPA is pleased that steps are being taken to move this project forward and that those steps include citizens such as you who have invested so much time and expertise. While there will be inevitable technical disagreements on the path forward, I am convinced we can work these through so that we can achieve a satisfactory remedy for the NFSS site.

Again, thank you for all of your hard work.

[redacted]
Radiation & Indoor Air Branch
U.S. EPA Region 2
290 Broadway
New York, NY 10007-1866

From: [redacted]
To: [redacted]
Cc: [redacted]

Date: 09/02/2010 03:50 PM

Subject: Re: An EPA Request to Again Consider a Recheck: IWCS concerns

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[redacted]

Yes, I have received responses from USACE and am in the process of reviewing those responses and discussing with other RAB members. I'm attaching the letter so everyone can read the page references you quoted. I noted that USACE has located and reviewed two additional performance monitoring reports for 1991 and 1992, so have requested these reports be posted on the USACE NFSS web site. I hope at some point EPA will thoroughly review all of the NFSS performance monitoring data. It's key information, which should be looked at before pronouncing judgement on the integrity of the IWCS.

From careful review of the available,1985 to 1990, performance monitoring data, it is clear to me that the IWCS is not performing as intended and not isolating the radioactive residues and wastes from the surrounding groundwater. The data records increased water levels inside the IWCS after closure and subsequent seasonal variation of water levels inside the IWCS. The seasonal variation in water levels inside the IWCS is confirmed by several years uninterrupted monitoring - the levels reach a maximum in spring and a minimum in fall. Please review the performance data itself and not just the USACE responses to me, as time permits later this month.

I would remind EPA that performance monitoring is only one of three separate pieces of evidence that indicates that the IWCS is not isolating the radioactive contents. The three pieces of evidence are:

i) varying water levels inside the IWCS, as provided by the performance monitoring program
ii) detection of radium and gross beta contamination in the LWBZ groundwater around the IWCS
iii) detection of uranium contamination in the UWBZ groundwater around the IWCS

Appropriate agency review and interpretation of the 24 years of IWCS monitoring data is lacking. Instead, what we have, is 24 years of inappropriate response to any results that indicate IWCS containment failure -discontinue those monitoring programs which produce problematic results and forget about them - the monitoring of water levels inside the IWCS in 1993 and the monitoring of the LWBZ groundwater in 1994 are both examples of this. Efforts to delineate the extent of contamination and identify migration pathways into the environment prove inaccurate because of significant data gaps and incorrect assumptions. By all means upgrade the IWCS monitoring programs, but please do not pretend that this alters the fact that the IWCS is already compromised.

With respect to migration of radioactive contamination, one pathway we talked about is the 10 inch potable water line on the NFSS acting as a preferential pathway for contamination to migrate from the south side of the IWCS and contaminate groundwater east of the IWCS (well OW-11B.) EPA had no

information on the age of the line or whether there are integrity issues, so I reviewed the historic documentation.

I hope the following information is useful.

The potable water line dates from the construction of the LOOW in the early 1940's. Concerns over the integrity of the potable water lines were first voiced by Bell Aerospace in 1957, when corrosion of the joints between the sections of the cast iron pipes was discovered. Later,in the mid 1970's the Town of Lewiston was sufficiently concerned about infiltration of contamination into the potable water lines, if the water pressure dropped, that a new potable water line was routed around the LOOW site. The age and the previous history of the potable water lines on the NFSS support the RI finding that the 10 inch water line is likely acting as a preferential pathway for contaminated groundwater to migrate away from the IWCS. The contamination in the line has the potential to contaminate groundwater wherever the line is sufficiently corroded, but the water lines have not been investigated - they should be. USACE has no information on the nature or extent of the radioactive contamination in the water lines, which is a significant data gap. In addition, I have found no record of the water lines having been plugged or severed on the NFSS, so there are potential pathways for contamination to move off site much faster than predicted.

Regards,
[redacted].

In a message dated 9/1/2010 10:34:27 A.M. Central Daylight Time, [redacted] writes:

Good Morning [redacted]

I believe the USACE has sent you a response dated August 30, 2010. They have sent me an electronic copy. Neither I nor my staff will have a chance to do a thorough review of their response until later in September due to other work priorities. I did, however, read with interest the response on pages 2 and 3 concerning the water levels inside the IWCS. I read with particular interest the four full paragraphs on p.3. I plan in the future to discuss this with USACE staff but I sense from these paragraphs that the VWPT data may have been a lot less likely to be accurate then planned when the transducer were installed by the Department of Energy.

Again, I have not fully reviewed the response, but from my limited look I see nothing which changes our judgement that the environmental pathway surveillance is the best indicator of the IWCS's integrity and that these data tell me the integrity is still adequate. Nothing in this response changes our position that further upgrades to the environmental radiation surveillance should be considered. That is to say, monitoring around the IWCS and not poking a hole into the IWCS is the best way to continue to determine the adequacy of the IWCS.

As we proceed further to look at data and responses for NFSS we will keep you and your colleagues informed.

I want to thank you for all your efforts in framing comments and questions. They sure have made us all think hard and long and look at the historical data again. While I have at times sensed you are frustrated with

EPA's position on the question of IWCS integrity because we may have different technical viewpoints, I certainly believe your input has created much value added and I think we are all better for it.

Best Regards,

[redacted]
Radiation & Indoor Air Branch
U.S. EPA Region 2
290 Broadway
New York, NY 10007-1866

From: [redacted]
To: [redacted]
Cc: [redacted]

Date: 08/30/2010 02:32 PM
Subject: Re: An EPA Request to Again Consider a Recheck: IWCS concerns

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[redacted],

As you requested, I have gone back through the available data, but I still have to conclude that the radioactive contents of the IWCS are not being isolated from the surrounding environment and that the contamination showing up in groundwater is more likely to be associated with leakage from the IWCS than from pre-existing contamination.

When considering IWCS integrity issues, no review is complete without looking at the performance monitoring program for the IWCS. I believe USACE and EPA are missing critical data by not reviewing performance monitoring reports for the period 1986 through 1990. The reports, which are now available on the USACE web site (in response to a specific RAB request) show:

i) water levels increased significantly in the IWCS following closure

ii) water levels in the IWCS continue to show seasonal variation, being at a maximum elevation in early spring (March or April) and at a minimum elevation in the fall (September or October.)

The IWCS was intended to isolate the radioactive wastes - nothing in and nothing out- clearly this is not the case when the water levels inside the IWCS increased significantly in the year after closure and then levels inside the IWCS are found to be following the seasonal variation of the groundwater outside. I am

again sending EPA a copy of the Bechtel report "Report on the Performance Monitoring System for the Interim Waste Containment at the Niagara Falls Storage Site", October 1985, DOE/OR/20722--71 (see attached document) which lists the objectives of the IWCS performance monitoring program and explains the role of the pressure transducers placed within the IWCS. The significance of performance monitoring data with respect to the integrity of the IWCS should become clear. Please review and comment at EPA's earliest convenience.

[redacted]

Note: I have not received any response from USACE to my restatement of concerns in July or received a response to my enquiries about whether USACE intend investigating the 10 inch potable water line and associated network of water lines. However, it is discouraging to find that USACE continues to claim that the system of IWCS transducers, used to indirectly measure the water levels inside the IWCS, was destroyed by lightning, shortly after installation of the pressure transducers in the IWCS ( USACE response to public comment no.19, August 18, 2010 on the USACE NFSS web site), while simultaneously posting performance monitoring reports which show the system was repaired and fully functional following the lightning strike in early 1987.

In a message dated 8/17/2010 2:08:03 P.M. Central Daylight Time, [redacted] writes:

Thank you for the prompt and thoughtful reply. I will go back and look at the specific references you quote for item 1, but can give you an immediate response to the other items.(See below in blue.)

2) I am fully aware of the changes USACE have made with respect to their interpretation of groundwater contamination and the reclassification of water in the sewer lines. However, this is irrelevant to my concerns about the 10" water line and associated water line network. The water lines on the NFSS have not been investigated, so there is no data to correct and reissue. This is one of a number of significant data gaps with respect to the IWCS. Recheck #2 While you are correct that the USACE had not investigated water intake mains...the 42" main or the 10" main that you referred to, they did look at the lines that were likely to have contamination which are the ones containing acid waste and sewage. These would be the most likely to have contamination.

I would agree that investigation of the waste lines and sewers is a logical place to start. My conclusions regarding the water lines stem from reviewing the data from the RI. To illustrate this, look at the sanitary sewer line which USACE has investigated near the IWCS by sampling at points MH08, MH07, MH06 and MH09. Results for total dissolved uranium in wastewater in the pipeline were:

| | |
|---|---|
| MH08 | 161 ug/l |
| MH07 | 27.1 ug/L |
| MH06 | 1210 ug/L |

MH09 < 12.4 ug/L

MH06 lies between points MH07 and MH09 so the greatest concentration of uranium in the sanitary sewer is centered on MH06. According to the RI, " The concentrations of the uranium isotopes in MH06 are greater than the estimated concentrations of those isotopes in the groundwater in the vicinity of MH06. However, the highest concentrations in the plume occur very near a subsurface water line. This water line heads northeast and intersects the path of the sanitary sewer near manhole MH06.The water line may be a preferential flow path exhibiting higher uranium concentrations than would be expected to be found in other flow paths through the native soil"

Given that TWP 833, which is south of the IWCS and close to the 10" water line was found to contain 950ug/L of total dissolved uranium, it would seem prudent to have investigated the water line. The most significant contamination in the sanitary sewer appears to be only where it intercepts the water line.

3) I think we are talking at cross purposes with respect to the water line. There are two different water intake lines for the LOOW site. The water line I am concerned about is not the 42" process water intake water line you refer to, but the 10" fresh water intake line, which passes close to the south eastern corner of the IWCS. I'm attaching a map taken from the NFSS RI as well as a map taken from a late 1980's NFSS environmental surveillance report. These should clarify the location of the water line of concern. The line just misses the Central Drainage Ditch before intersecting the South 31 ditch and eventually turning north.

The line has not been investigated, so there is no data on the contamination within the line, but it is clear from the recent RI data that groundwater samples taken in the vicinity of this pipeline consistently show significant uranium contamination. The 10" water line feeds into numerous water lines across the NFSS, eventually passing off the NFSS along the northern boundary of the site. I would draw your attention to well OW-11B which lies down gradient of the pipeline and up-gradient of the Central Drainage Ditch. Recent groundwater samples from monitoring well OW-11B, have shown a sharp increase in the levels of uranium present. (See attached plot of uranium detections in well OW-11B.) Recheck #3 No doubt there is an increase in uranium levels in the shallow groundwater monitoring well OW11B. Before we implicate the 10" main as I believe you are concluding take a look at the waste water treatment line which also passes by OW11B and which contained 1300 ug/l of total uranium. I think you have to ask yourself which line is more likely to cause the contamination seen, the waste water line or a line that provided intake water. Also, as I recollect from my last on site visit with our National Air and Radiation Environmental Lab expert, the groundwater flow for the shallow groundwater is in a northwesterly direction. This well in question is 180 feet east of the IWCS and as such is upgradient of the IWCS. From our way of thinking this would be a poor indicator of the IWCS integrity and a better indication of groundwater contamination from the wastewater line mentioned above. Further, I have talked about this with the USACE staff and I would suggest that there are some wells that are closer and are screened in the shallow water-bearing zone which might be more indicative of the integrity of the eastern side of the IWCS (i.e. 862, A50, A51, and 860). Again, we are not suggesting that all is okay with the groundwater as evident from OW-11B, but we just cannot make a case that it is from the IWCS.

I think you have a point about the sanitary sewer passing close to well OW11B than does the water line, but the question is where is the contamination in the sanitary sewer coming from? As described above, the contamination is centered on the point where the sanitary sewer intercepts the water line. The water line passes through an identified area of uranium groundwater contamination, so it is logical to suspect the water line of transporting contamination to the sanitary sewer. Yet the water line has not been investigated. Given the results of the RI, I think it should have been.

Groundwater does indeed flow toward the Central Drainage Ditch in a north westerly direction from OW-11B, but I was not suggesting that increasing levels of uranium in well OW-11B be taken as an indicator of IWCS leakage along the eastern side of the IWCS. I think well OW-11B is an indicator, albeit delayed of leakage from the south side of the IWCS, contamination having migrated along the water line. Since the water line is passing through an area of known contamination and contamination in the sanitary sewer is so much lower at adjacent sampling points, either side of MH06, I think the water line is the logical suspect for contamination migration; the sanitary sewer line is likely a secondary conduit.

4) I believe uranium groundwater contamination is much more extensive on the NFSS than has been reported and is largely associated with water line contamination. Recheck #4 I would agree that groundwater contamination is likely to be more extensive than currently indicated by the data as 35+ years of experience always tells me that. I would however, suggest that this is far more likely to be from the sewage lines and not the water lines. We know the sewage lines were contaminated and there is the strongest of suspicions that these have caused groundwater contamination.

When I look at where uranium contamination is showing up in the upper groundwater at the NFSS, I find there is usually is a water line close by. I would suspect the water lines. Since there has been no investigation of the water lines, we won't know for definite until USACE sample the lines. Are you aware of any such plans?

5) I hope this is helpful to EPA in explaining why I still believe the IWCS is leaking. Recheck #5 while clearly we don't agree as to whether OW-11B contamination results from the IWCS or the sewage line adjacent to the well, I thought we agreed at our June meeting that further monitoring of the central drainage ditch should be pursued and that has been communicated to the USACE.

We agree that the contamination in well OW-11B is coming from the southeast, just disagree on whether the water line is implicated. An additional concern of contamination showing up in OW-11B, is that the contaminated groundwater will discharge to the Central Drainage Ditch.

[redacted]

In a message dated 8/17/2010 11:00:42 A.M. Central Daylight Time, [redacted] writes:

Hi [redacted]:

Again, and with all due respect, I think you are missing some things....please consider rechecking. I have indicated where you may wish to re-check in bold italics next to your comments.

Further, I believe the USACE is planning on responding to your specific comments shortly, and by that I mean by the end of August. You may wish to contact [redacted] to get a better feel for that. Until then it might be best to wait and see what the actual data the USACE provides indicates.

[redacted]
Radiation & Indoor Air Branch
U.S. EPA Region 2
290 Broadway
New York, NY 10007-1866

From: [redacted]
To: [redacted]
Cc: [redacted]

Date: 08/17/2010 08:35 AM
Subject: Re: IWCS concerns

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Hi [redacted],

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There are several inaccuracies in your email. Please allow me to correct.

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Limited RI detections of significant surface and subsurface uranium contamination in this area, correlates with the findings of the 1981 Bechtel survey. This supports the view that uranium groundwater contamination in this area is not pre-existing with respect to the IWCS. Note, the levels of uranium contamination in the groundwater at this location are far in excess of levels previously associated with pre-existing contamination around the IWCS. USACE has evaluated historic photographs which show material stored near building 409 and speculated that the surface storage of these materials has caused the present day groundwater contamination, but has not presented the public with any historic data proving pre-existing contamination of the area around building 409. The historic data is in the Bechtel Report of 1996 as mentioned above. I know the USACE has this report and is aware of this.

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The line has not been investigated, so there is no data on the contamination within the line, but it is clear from the recent RI data that groundwater samples taken in the vicinity of this pipeline consistently show significant uranium contamination. The 10" water line feeds into numerous water lines across the NFSS, eventually passing off the NFSS along the northern boundary of the site. I would draw your attention to well OW-11B which lies down gradient of the pipeline and up-gradient of the Central Drainage Ditch. Recent groundwater samples from monitoring well OW-11B, have shown a sharp increase in the levels of uranium present. (See attached plot of uranium detections in well OW-11B.) Recheck #3 No doubt there is an increase in uranium levels in the shallow groundwater monitoring well OW11B. Before we implicate the 10" main as I believe you are concluding take a look at the waste water treatment line which

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I certainly agree there is radionuclide contamination outside of the actual IWCS and this needs to be addressed. I, however, do not think that any of this results from the IWCS and that remains the EPA position. When you recheck the chronology of events you may see my point. Let me know if you do not after you have re-reviewed the material.

[redacted]
Radiation & Indoor Air Branch
U.S. EPA Region 2
290 Broadway
New York, NY 10007-1866

From: [redacted]
To: [redacted]
Cc: [redacted]
Date: 08/16/2010 07:33 AM
Subject: Re: IWCS concerns

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Having carefully reviewed the data and documents, I am in no doubt that the IWCS is leaking. Further, there is no effective system in place for subsurface monitoring of the IWCS.

There are several pieces of evidence of IWCS failure. The most concerning, at this point, is the high level of uranium contamination in groundwater south of the IWCS. USACE have stated that this contamination is pre-existing but, for a number of reasons, I believe that is not the case and that the contamination is being caused by leakage from the IWCS. Passing through this area of contamination is a disused water line, which appears to be acting as a preferential pathway for radioactive contamination to migrate away from the IWCS much faster than predicted.

At the June public meeting USACE confirmed that the NFSS water lines had not been included in the RI investigation and agreed to look into the issue. I have not received any further response from USACE to address this concern and am not aware of any subsequent information provided to the public (if there is please let me know). The feasibility study does not address the contaminated water lines on the NFSS, so how will the extent and nature of the radioactive contamination in the water lines and its impact on the surrounding groundwater be investigated?

The RAB radiological committee will be discussing the detailed evidence of IWCS failure later this week.

Ann Roberts.

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U.S. EPA Region 2
290 Broadway
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From: [redacted]
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[redacted]

Date: 08/16/2010 07:33 AM
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=

In a message dated 9/24/2010 9:04:16 P.M. GMT Daylight Time, [redacted] writes:

Hello [redacted]:

I wanted to respond to your most recent email of September 2, 2010 in which you requested that the U.S. Environmental Protection Agency (EPA) do a thorough review of the various Niagara Falls Storage Site (NFSS) data sets. Before I provide our response, I want to thank you for all of the time and effort you have put forth in reviewing the available data and analyzing the situation at NFSS and in particular that involving the Interim Waste Containment Structure (IWCS).

Background

We also had a telephone conversation previous to your most recent emails where we covered several points. One of these points was the need to focus our efforts on the IWCS as a priority because of the quantity of radioactive material contained therein. Another point we discussed was the priority for getting a feasibility study for the site completed as soon as possible so that available funding could be applied to the site for a remedy, once one had been ultimately formulated. In this context, let me respond to your previous email.

EPA believes that it has done a thorough review of the NFSS data available. In our review we have relied most heavily on data for which a quality assurance project plan (QAPP) exists. When data has been supplied for which no QAPP was available we took note of that data, but consistent with EPA policy, we did not rely on it for decision-making.

Environmental Monitoring/Surveillance Data

Based on the environmental monitoring data available from the U.S. Army Corps of Engineers (USACE) and for which the data is covered by their QAPP, we find that all environmental monitoring data indicates that the IWCS is performing as it was designed and that it is currently containing the wastes contained therein. We note that well 11B has shown some increases in Uranium levels. We do not believe that this well is indicative of any leakage occurring from the IWCS because of its location. It is located past other closer down gradient wells which do not exhibit similar increases and it is across the central drainage ditch. As such we would not consider the data from well 11B as an

indicator for the integrity of the IWCS. We further believe that in all cases where anomalous reading in groundwater well monitoring data have been seen, it can be explained by radioactive contamination not contained within the IWCS. In short, these data give us no reason to believe that the IWCS has leaked or is currently leaking.

We agree that the various water mains on the NFSS site need further investigation to determine if they may contain radioactive contamination. In some cases these mains could also have created some contamination immediately adjacent to them when they were not encased in concrete or similarly protected. We have communicated this to the USACE as you are aware. We also do not believe that these water mains are a conduit for the leakage of radioactivity from the IWCS because they do not come in contact with the IWCS and there is no evidence of such a direct pathway. Notwithstanding, we have recommended that to the USACE that they evaluate all of the water lines for contamination and deal with them accordingly through the Feasibility Study (FS) process. I want to emphasize we do not believe the investigation of the water lines is a higher priority then a remedy for the IWCS. We believe these mains can be handled during the FS process and that the IWCS source is the priority for consideration and remediation. It is my understanding that the USACE concurs with our opinion on the water mains and their relative importance and will be dealing with them accordingly in the FS process.

IWCS Water Level Measurement Data

We have also endeavored to perform a thorough review of the IWCS water level data. In doing so, we have found this to be a difficult and very inconclusive effort. The data provided as part of the original work by Bechtel National Inc. (BNI) for the U.S. Department of Energy (DOE) does not appear to have any QAPP that either EPA or the USACE could obtain. We reviewed the apparent attempts to show the validity of the data by BNI and we are not convinced that the scheme was working in a manner that would provide meaningful data. We would also note that the historical record shows that the system was struck, not once, but twice, by lightning. EPA staff has concluded that the efforts in 1991 to correlate the transducer data are at best inconclusive and probably indicate the system was not working well enough to be useful. The USACE and EPA have tried to get the 1992 Performance Monitoring Report but have been unable to obtain it, if it in fact exists. The USACE is continuing its data collection process for this matter. We also note that from the time when the system was completed there were several operations done on the cover including irrigation, growing grass, etc. that could have affected the water levels in the trench, if they truly were varying. I have personally had frank conversations with my staff and while we may disagree that the data from the DOE's trench water monitoring program is flawed because the system didn't work correctly or the overall program didn't sufficiently account for cap maintenance, we agree that the data is not usable for determining the current integrity of the IWCS. I have had similar frank conversations with the USACE and I would suggest they conclude similarly.

I want to also highlight a portion of the history of this site. For the period beginning in the mid 1980s through 1997 the DOE was responsible for the FUSRAP program and BNI was their contractor for this site. Beginning in 1998 Congress changed this and made the USACE responsible for the FUSRAP program. The

USACE did not continue using BNI as a contractor. This has made it difficult for EPA to get information on activities such as the 1992 Performance Monitoring Report and other possible information sources that may shed more light on the trench water monitoring. We understand the USACE has also had similar difficulties. While it is not our place to comment on Congress' wisdom in transferring the FUSRAP program or the relative merits of one Federal agency over another, it appears that the transition has not been so smooth that all data and all reports are accounted for. The USACE has told me that they continue to pursue data sources especially from DOE's contractor and find themselves in the position that they may have to actually procure missing information. To the USACE's credit they are still pursuing this, but at this time we can categorize our knowledge of the data for the trench water monitoring as incomplete, inconclusive, and as such not suitable for decision-making. Based on this we have concluded that trench water monitoring data of the late 1980s and early 1990s, data that is more than 20 years old, does not indicate any leakage from the IWCS. We will reconsider this opinion if further data from that period becomes available. We have also suggested to the USACE that they should consider water level measurements in the IWCS if a suitable technology exists that would not compromise the integrity of the cap of the IWCS. I believe we discussed this when we met in June and you are aware of our concerns about penetrating the cap and releasing radon gas. Finally, the most recent radon measurement conducted by the USACE does confirm the integrity of the IWCS cap. As such we feel confident in discounting 20 year-old water level data taken from a system without an apparent QAPP.

Enhanced Environmental Monitoring

While we have concluded that the IWCS is containing the wastes we also have agreed with citizens who believe that enhanced environmental monitoring should be considered to assure an early warning system of any failure of the IWCS into the future. Again, as we discussed when we met in June, we have made several suggestions to the USACE concerning EPA's thoughts on enhanced monitoring. It is our understanding that the USACE is considering these suggestions and will be getting back to us before the next Stakeholder meeting in November.

CERCLA PROCESS: FS/Preferred Alternative/Record of Decision (ROD)

We have continued to suggest to the USACE that they execute an FS for the site with primary emphasis on the IWCS so that a preferred alternative can be formulated and when funding is available duly executed. We continue to suggest this be done without delay and that tasks involved in enhancing environmental monitoring and in further data collection be worked into the FS process to avoid delays in the ultimate goal of a preferred alternative. This would include the needed review of water mains and their remedy if and as necessary. We base these suggestions on the fact the data that is available and for which data quality has been assured, indicates there is no current threat to the surrounding population at this time. The current monitoring when enhanced can provide adequate assurance that public health and the environment can be protected in a time frame consistent with the development of an FS, a preferred alternative and a Record of Decision (ROD). We do, however, note that annual funding for the FUSRAP program has been about $130 million per year. This is for all FUSRAP sites nationwide which the USACE must address. The most recent estimate for remedying this site

was done by the DOE quite a while ago and estimated the cost to be between $500 million and $1 billion. Simply adjusting for inflation and advances in technology would imply that going forward, this figure is now low. As such, if current funding levels were to be maintained and could all be applied to this site, the actual remedial work would last perhaps a decade or longer. Historically it has been difficult to assure adequate disposal capacity for wastes as highly radioactive as these for that length of time into the future. It is with this in mind that EPA believes it is time to go forward as soon as possible in formulating the necessary tools to get this site into active remediation. Given the finite resources available and the time frames involved, we believe that interrupting the current FS process, with further remedial investigations which are unlikely to show any potential public health and environmental consequences, is unwarranted.

Looking Forward

EPA plans to attend the next USACE Stakeholder meeting in early November. We understand that the DOE is also planning on attending that meeting. Further, we understand from your colleagues [redacted] and [redacted], that the USACE and your core of involved citizens are working to further enhance technical citizen input into the FS process through a facilitator. EPA is pleased that steps are being taken to move this project forward and that those steps include citizens such as you who have invested so much time and expertise. While there will be inevitable technical disagreements on the path forward, I am convinced we can work these through so that we can achieve a satisfactory remedy for the NFSS site.

Again, thank you for all of your hard work.

[redacted]
U.S. EPA Region 2
290 Broadway
New York, NY 10007-1866

From: [redacted]
Cc: [redacted]

Date: 09/02/2010 03:50 PM
Subject: Re: An EPA Request to Again Consider a Recheck: IWCS concerns

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Paul,

Yes, I have received responses from USACE and am in the process of reviewing those responses and discussing with other RAB members. I'm attaching the letter so everyone can read the page references you quoted. I noted that USACE has located and reviewed two additional performance monitoring reports for 1991 and 1992, so have requested these reports be posted on the USACE NFSS web site. I hope at some point EPA will thoroughly review all of the NFSS performance monitoring data. It's key information, which should be looked at before pronouncing judgement on the integrity of the IWCS.

From careful review of the available,1985 to 1990, performance monitoring data, it is clear to me that the IWCS is not performing as intended and not isolating the radioactive residues and wastes from the surrounding groundwater. The data records increased water levels inside the IWCS after closure and subsequent seasonal variation of water levels inside the IWCS. The seasonal variation in water levels inside the IWCS is confirmed by several years uninterrupted monitoring - the levels reach a maximum in spring and a minimum in fall. Please review the performance data itself and not just the USACE responses to me, as time permits later this month.

I would remind EPA that performance monitoring is only one of three separate pieces of evidence that indicates that the IWCS is not isolating the radioactive contents. The three pieces of evidence are:

i) varying water levels inside the IWCS, as provided by the performance monitoring program
ii) detection of radium and gross beta contamination in the LWBZ groundwater around the IWCS
iii) detection of uranium contamination in the UWBZ groundwater around the IWCS

Appropriate agency review and interpretation of the 24 years of IWCS monitoring data is lacking. Instead, what we have, is 24 years of inappropriate response to any results that indicate IWCS containment failure -discontinue those monitoring programs which produce problematic results and forget about them - the monitoring of water levels inside the IWCS in 1993 and the monitoring of the LWBZ groundwater in 1994 are both examples of this. Efforts to delineate the extent of contamination and identify migration pathways into the environment prove inaccurate because of significant data gaps and incorrect assumptions. By all means upgrade the IWCS monitoring programs, but please do not pretend that this alters the fact that the IWCS is already compromised.

With respect to migration of radioactive contamination, one pathway we talked about is the 10 inch potable water line on the NFSS acting as a preferential pathway for contamination to migrate from the south side of the IWCS and contaminate groundwater east of the IWCS (well OW-11B.) EPA had no information on the age of the line or whether there are integrity issues, so I reviewed the historic documentation.

I hope the following information is useful.

The potable water line dates from the construction of the LOOW in the early 1940's. Concerns over the integrity of the potable water lines were first voiced by Bell Aerospace in 1957, when corrosion of the joints between the

sections of the cast iron pipes was discovered. Later,in the mid 1970's the Town of Lewiston was sufficiently concerned about infiltration of contamination into the potable water lines, if the water pressure dropped, that a new potable water line was routed around the LOOW site. The age and the previous history of the potable water lines on the NFSS support the RI finding that the 10 inch water line is likely acting as a preferential pathway for contaminated groundwater to migrate away from the IWCS. The contamination in the line has the potential to contaminate groundwater wherever the line is sufficiently corroded, but the water lines have not been investigated - they should be. USACE has no information on the nature or extent of the radioactive contamination in the water lines, which is a significant data gap. In addition, I have found no record of the water lines having been plugged or severed on the NFSS, so there are potential pathways for contamination to move off site much faster than predicted.

Regards,
[redacted]

In a message dated 9/1/2010 10:34:27 A.M. Central Daylight Time, [redacted] writes:

Good Morning [redacted]

I believe the USACE has sent you a response dated August 30, 2010. They have sent me an electronic copy. Neither I nor my staff will have a chance to do a thorough review of their response until later in September due to other work priorities. I did, however, read with interest the response on pages 2 and 3 concerning the water levels inside the IWCS. I read with particular interest the four full paragraphs on p.3. I plan in the future to discuss this with USACE staff but I sense from these paragraphs that the VWPT data may have been a lot less likely to be accurate then planned when the transducer were installed by the Department of Energy.

Again, I have not fully reviewed the response, but from my limited look I see nothing which changes our judgement that the environmental pathway surveillance is the best indicator of the IWCS's integrity and that these data tell me the integrity is still adequate. Nothing in this response changes our position that further upgrades to the environmental radiation surveillance should be considered. That is to say, monitoring around the IWCS and not poking a hole into the IWCS is the best way to continue to determine the adequacy of the IWCS.

As we proceed further to look at data and responses for NFSS we will keep you and your colleagues informed.

I want to thank you for all your efforts in framing comments and questions. They sure have made us all think hard and long and look at the historical data again. While I have at times sensed you are frustrated with EPA's position on the question of IWCS integrity because we may have different technical viewpoints, I certainly believe your input has created much value added and I think we are all better for it.

Best Regards,

[redacted], Chief
Radiation & Indoor Air Branch
U.S. EPA Region 2
290 Broadway
New York, NY 10007-1866

From: [redacted]
To: [redacted]
Cc: [redacted]

Date: 08/30/2010 02:32 PM
Subject: Re: An EPA Request to Again Consider a Recheck: IWCS concerns

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[redacted],

As you requested, I have gone back through the available data, but I still have to conclude that the radioactive contents of the IWCS are not being isolated from the surrounding environment and that the contamination showing up in groundwater is more likely to be associated with leakage from the IWCS than from pre-existing contamination.

When considering IWCS integrity issues, no review is complete without looking at the performance monitoring program for the IWCS. I believe USACE and EPA are missing critical data by not reviewing performance monitoring reports for the period 1986 through 1990. The reports, which are now available on the USACE web site (in response to a specific RAB request) show:

i) water levels increased significantly in the IWCS following closure

ii) water levels in the IWCS continue to show seasonal variation, being at a maximum elevation in early spring (March or April) and at a minimum elevation in the fall (September or October.)

The IWCS was intended to isolate the radioactive wastes - nothing in and nothing out- clearly this is not the case when the water levels inside the IWCS increased significantly in the year after closure and then levels inside the IWCS are found to be following the seasonal variation of the groundwater outside. I am again sending EPA a copy of the Bechtel report "Report on the Performance Monitoring System for the Interim Waste Containment at the Niagara Falls Storage Site", October 1985, DOE/OR/20722--71 (see attached document) which lists the objectives of the IWCS performance monitoring program and explains the role of

the pressure transducers placed within the IWCS. The significance of performance monitoring data with respect to the integrity of the IWCS should become clear. Please review and comment at EPA's earliest convenience.

[redacted]

Note: I have not received any response from USACE to my restatement of concerns in July or received a response to my enquiries about whether USACE intend investigating the 10 inch potable water line and associated network of water lines. However, it is discouraging to find that USACE continues to claim that the system of IWCS transducers, used to indirectly measure the water levels inside the IWCS, was destroyed by lightning, shortly after installation of the pressure transducers in the IWCS ( USACE response to public comment no.19, August 18, 2010 on the USACE NFSS web site), while simultaneously posting performance monitoring reports which show the system was repaired and fully functional following the lightning strike in early 1987.

In a message dated 8/17/2010 2:08:03 P.M. Central Daylight Time, [redacted] writes:

Thank you for the prompt and thoughtful reply. I will go back and look at the specific references you quote for item 1, but can give you an immediate response to the other items.(See below in blue.)

2) I am fully aware of the changes USACE have made with respect to their interpretation of groundwater contamination and the reclassification of water in the sewer lines. However, this is irrelevant to my concerns about the 10" water line and associated water line network. The water lines on the NFSS have not been investigated, so there is no data to correct and reissue. This is one of a number of significant data gaps with respect to the IWCS. Recheck #2 While you are correct that the USACE had not investigated water intake mains...the 42" main or the 10" main that you referred to, they did look at the lines that were likely to have contamination which are the ones containing acid waste and sewage. These would be the most likely to have contamination.

I would agree that investigation of the waste lines and sewers is a logical place to start. My conclusions regarding the water lines stem from reviewing the data from the RI. To illustrate this, look at the sanitary sewer line which USACE has investigated near the IWCS by sampling at points MH08, MH07, MH06 and MH09. Results for total dissolved uranium in wastewater in the pipeline were:

| | |
|---|---|
| MH08 | 161 ug/l |
| MH07 | 27.1 ug/L |
| MH06 | 1210 ug/L |
| MH09 | < 12.4 ug/L |

MH06 lies between points MH07 and MH09 so the greatest concentration of uranium in the sanitary sewer is centered on MH06. According to the RI, " The concentrations of the uranium isotopes in MH06 are greater than the estimated concentrations of those isotopes in the groundwater in the vicinity of MH06. However, the highest concentrations in the plume occur very near a subsurface water line. This water line heads northeast and intersects the path of the sanitary sewer near manhole MH06.The water line may be a preferential flow path exhibiting higher uranium concentrations than would be expected to be found in other flow paths through the native soil"

Given that TWP 833, which is south of the IWCS and close to the 10" water line was found to contain 950ug/L of total dissolved uranium, it would seem prudent to have investigated the water line. The most significant contamination in the sanitary sewer appears to be only where it intercepts the water line.

3) I think we are talking at cross purposes with respect to the water line. There are two different water intake lines for the LOOW site. The water line I am concerned about is not the 42" process water intake water line you refer to, but the 10" fresh water intake line, which passes close to the south eastern corner of the IWCS. I'm attaching a map taken from the NFSS RI as well as a map taken from a late 1980's NFSS environmental surveillance report. These should clarify the location of the water line of concern. The line just misses the Central Drainage Ditch before intersecting the South 31 ditch and eventually turning north.

The line has not been investigated, so there is no data on the contamination within the line, but it is clear from the recent RI data that groundwater samples taken in the vicinity of this pipeline consistently show significant uranium contamination. The 10" water line feeds into numerous water lines across the NFSS, eventually passing off the NFSS along the northern boundary of the site. I would draw your attention to well OW-11B which lies down gradient of the pipeline and up-gradient of the Central Drainage Ditch. Recent groundwater samples from monitoring well OW-11B, have shown a sharp increase in the levels of uranium present. (See attached plot of uranium detections in well OW-11B.) Recheck #3 No doubt there is an increase in uranium levels in the shallow groundwater monitoring well OW11B. Before we implicate the 10" main as I believe you are concluding take a look at the waste water treatment line which also passes by OW11B and which contained 1300 ug/l of total uranium. I think you have to ask yourself which line is more likely to cause the contamination seen, the waste water line or a line that provided intake water. Also, as I recollect from my last on site visit with our National Air and Radiation Environmental Lab expert, the groundwater flow for the shallow groundwater is in a northwesterly direction. This well in question is 180 feet east of the IWCS and as such is upgradient of the IWCS. From our way of thinking this would be a poor indicator of the IWCS integrity and a better indication of groundwater contamination from the wastewater line mentioned above. Further, I have talked about this with the USACE staff and I would suggest that there are some wells that are closer and are screened in the shallow water-bearing zone which might be more indicative of the integrity of the eastern side of the IWCS (i.e. 862, A50, A51, and 860). Again, we are not suggesting that all is okay with the groundwater as evident from OW-11B, but we just cannot make a case that it is from the IWCS.

I think you have a point about the sanitary sewer passing close to well OW11B than does the water line, but the question is where is the contamination in the sanitary sewer coming from? As described above, the contamination is centered on the point where the sanitary sewer intercepts the water line. The water line passes through an identified area of uranium groundwater contamination, so it is logical to suspect the water line of transporting contamination to the sanitary sewer. Yet the water line has not been investigated. Given the results of the RI, I think it should have been.

Groundwater does indeed flow toward the Central Drainage Ditch in a north westerly direction from OW-11B, but I was not suggesting that increasing levels

of uranium in well OW-11B be taken as an indicator of IWCS leakage along the eastern side of the IWCS. I think well OW-11B is an indicator, albeit delayed of leakage from the south side of the IWCS, contamination having migrated along the water line. Since the water line is passing through an area of known contamination and contamination in the sanitary sewer is so much lower at adjacent sampling points, either side of MH06, I think the water line is the logical suspect for contamination migration; the sanitary sewer line is likely a secondary conduit.

4) I believe uranium groundwater contamination is much more extensive on the NFSS than has been reported and is largely associated with water line contamination. Recheck #4 I would agree that groundwater contamination is likely to be more extensive than currently indicated by the data as 35+ years of experience always tells me that. I would however, suggest that this is far more likely to be from the sewage lines and not the water lines. We know the sewage lines were contaminated and there is the strongest of suspicions that these have caused groundwater contamination.

When I look at where uranium contamination is showing up in the upper groundwater at the NFSS, I find there is usually is a water line close by. I would suspect the water lines. Since there has been no investigation of the water lines, we won't know for definite until USACE sample the lines. Are you aware of any such plans?

5) I hope this is helpful to EPA in explaining why I still believe the IWCS is leaking. Recheck #5 while clearly we don't agree as to whether OW-11B contamination results from the IWCS or the sewage line adjacent to the well, I thought we agreed at our June meeting that further monitoring of the central drainage ditch should be pursued and that has been communicated to the USACE.

We agree that the contamination in well OW-11B is coming from the southeast, just disagree on whether the water line is implicated. An additional concern of contamination showing up in OW-11B, is that the contaminated groundwater will discharge to the Central Drainage Ditch.

[redacted]

In a message dated 8/17/2010 11:00:42 A.M. Central Daylight Time, [redacted] writes:

Hi [redacted]

Again, and with all due respect, I think you are missing some things....please consider rechecking. I have indicated where you may wish to re-check in bold italics next to your comments.

Further, I believe the USACE is planning on responding to your specific comments shortly, and by that I mean by the end of August. You may wish to contact John Busse to get a better feel for that. Until then it might be best to wait and see what the actual data the USACE provides indicates.

[redacted]

Radiation & Indoor Air Branch
U.S. EPA Region 2
290 Broadway
New York, NY 10007-1866

From: [redacted]
To: [redacted]
Cc: [redacted]

Date: 08/17/2010 08:35 AM
Subject: Re: IWCS concerns

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Hi [redacted],

I have already checked my work several times, before concluding that the IWCS is leaking - it's too important an issue for me not to be thorough. I have reviewed performance monitoring data (measuring the water levels inside the IWCS), which provided early detection of IWCS integrity problems, and IWCS groundwater monitoring data, which was intended to provide a secondary, albeit delayed system for identifying IWCS integrity problems. Detailed review of both monitoring programs leads me to conclude the IWCS is leaking. I find there is a pattern of abandonment of IWCS monitoring, seemingly in response to unwelcome monitoring results - this applies to performance monitoring and groundwater monitoring of the lower water bearing zone.

There are several inaccuracies in your email. Please allow me to correct.

1) According to Bechtel in 1981, there was no contamination identified in the area immediately south of the IWCS. I attach the relevant page of the survey. The area of concern is immediately east of building 409, where groundwater has been found to contain 958ug/L of dissolved total uranium. Detections of uranium in surface soil and subsurface soil at this location do not correlate with the extremely high levels of uranium currently being detected in the groundwater below. Recheck #1 - The DOE did soil remediation around Building 409 in the 1982-3 and this was after they realized that their 1981 report underestimated the contamination. I believe Figure 3-2 on p 21 of their 1996 report is what you want to refer to. We would conclude that there was significant enough uranium contamination to cause the groundwater contamination levels that were seen.

Limited RI detections of significant surface and subsurface uranium contamination in this area, correlates with the findings of the 1981 Bechtel survey. This supports the view that uranium groundwater contamination in this area is not pre-existing with respect to the IWCS. Note, the levels of uranium contamination in the groundwater at this location are far in excess of levels

previously associated with pre-existing contamination around the IWCS. USACE has evaluated historic photographs which show material stored near building 409 and speculated that the surface storage of these materials has caused the present day groundwater contamination, but has not presented the public with any historic data proving pre-existing contamination of the area around building 409. The historic data is in the Bechtel Report of 1996 as mentioned above. I know the USACE has this report and is aware of this.

2) I am fully aware of the changes USACE have made with respect to their interpretation of groundwater contamination and the reclassification of water in the sewer lines. However, this is irrelevant to my concerns about the 10" water line and associated water line network. The water lines on the NFSS have not been investigated, so there is no data to correct and reissue. This is one of a number of significant data gaps with respect to the IWCS. Recheck #2 While you are correct that the USACE had not investigated water intake mains...the 42" main or the 10" main that you referred to, they did look at the lines that were likely to have contamination which are the ones containing acid waste and sewage. These would be the most likely to have contamination.

3) I think we are talking at cross purposes with respect to the water line. There are two different water intake lines for the LOOW site. The water line I am concerned about is not the 42" process water intake water line you refer to, but the 10" fresh water intake line, which passes close to the south eastern corner of the IWCS. I'm attaching a map taken from the NFSS RI as well as a map taken from a late 1980's NFSS environmental surveillance report. These should clarify the location of the water line of concern. The line just misses the Central Drainage Ditch before intersecting the South 31 ditch and eventually turning north.

The line has not been investigated, so there is no data on the contamination within the line, but it is clear from the recent RI data that groundwater samples taken in the vicinity of this pipeline consistently show significant uranium contamination. The 10" water line feeds into numerous water lines across the NFSS, eventually passing off the NFSS along the northern boundary of the site. I would draw your attention to well OW-11B which lies down gradient of the pipeline and up-gradient of the Central Drainage Ditch. Recent groundwater samples from monitoring well OW-11B, have shown a sharp increase in the levels of uranium present. (See attached plot of uranium detections in well OW-11B.) Recheck #3 No doubt there is an increase in uranium levels in the shallow groundwater monitoring well OW11B. Before we implicate the 10" main as I believe you are concluding take a look at the waste water treatment line which also passes by OW11B and which contained 1300 ug/l of total uranium. I think you have to ask yourself which line is more likely to cause the contamination seen, the waste water line or a line that provided intake water. Also, as I recollect from my last on site visit with our National Air and Radiation Environmental Lab expert, the groundwater flow for the shallow groundwater is in a northwesterly direction. This well in question is 180 feet east of the IWCS and as such is upgradient of the IWCS. From our way of thinking this would be a poor indicator of the IWCS integrity and a better indication of groundwater contamination from the wastewater line mentioned above. Further, I have talked about this with the USACE staff and I would suggest that there are some wells that are closer and are screened in the shallow water-bearing zone which might be more indicative of the

integrity of the eastern side of the IWCS (i.e. 862, A50, A51, and 860). Again, we are not suggesting that all is okay with the groundwater as evident from OW-11B, but we just cannot make a case that it is from the IWCS.

I believe uranium groundwater contamination is much more extensive on the NFSS than has been reported and is largely associated with water line contamination. Recheck #4 I would agree that groundwater contamination is likely to be more extensive than currently indicated by the data as 35+ years of experience always tells me that. I would however, suggest that this is far more likely to be from the sewage lines and not the water lines. We know the sewage lines were contaminated and there is the strongest of suspicions that these have caused groundwater contamination. Well OW-11B is an example of how contamination is spreading out from the IWCS and contaminating the upper water bearing groundwater on site. The Central Drainage Ditch, down-gradient of well OW-11B is known to receive groundwater when the water table is high, so there is the potential for contamination to be moving off site in the surface water, as well as contamination migrating off site along the water lines leaving the NFSS.

I don't think USACE disputes that the 10" water line is intact from the point it passes the IWCS to where the associated water lines leave the NFSS.

I hope this is helpful to EPA in explaining why I still believe the IWCS is leaking. Recheck #5 while clearly we don't agree as to whether OW-11B contamination results from the IWCS or the sewage line adjacent to the well, I thought we agreed at our June meeting that further monitoring of the central drainage ditch should be pursued and that has been communicated to the USACE.

[redacted]

In a message dated 8/16/2010 11:04:38 A.M. Central Daylight Time, [redacted] writes:

Hi [redacted]

I think you need to recheck your work. You may have some faulty assumptions. The contamination you are mentioning as I recollect pre-existed the IWCS as it was noted in a report by Bechtel in 1981 which is before the IWCS was installed. As such that contamination is not indicative of any IWCS failure.

Further, there is some confusion that seems to be occurring in the way people are seeing some of the groundwater data. The USACE used some data from wastewater-sewage lines and reported these as groundwater as a rather conservative measure because one of the lines actually fed into a temporary monitoring well. Again, I think this is material that certainly predates the IWCS. I have in the course of settling on responses to our comments learned that the USACE will be redoing some of their groundwater maps so that ONLY groundwater is included and not something that may have come from a pre-exiting sewage line.

I have no problem with your categorization of the contamination you noted but it isn't likely to be from the IWCS.

The 42" main was given to the Town of Lewiston by the Federal Government around 1971 and plugged or severed between then and 1981....preliminary

indications are around 1979, but whatever, before the IWCS was engineered. It is my understanding that the USACE's decision not to sample the 42" main was a direct result of the fact that the main was plugged and was originally used as a forced main to bring clean (so to speak) cooling water from the Niagara River. Again, this is not a conduit for anything offsite from the IWCS as it was closed and sealed [apparently] well before the IWCS was built. Actually, I volunteered EPA to look at the 42" main on behalf of a citizen at the June meeting and the USACE has been giving me their data. They may also be pursuing this too. EPA is in the process of having our attorneys make certain requests for information from the various parties [not USACE] so we have our facts straight on the 42" main and where it was plugged, when and where it was flushed, etc. Please stay tuned on that....we won't be getting answers through this route very quickly.

I certainly agree there is radionuclide contamination outside of the actual IWCS and this needs to be addressed. I, however, do not think that any of this results from the IWCS and that remains the EPA position. When you recheck the chronology of events you may see my point. Let me know if you do not after you have re-reviewed the material.

[redacted]
Radiation & Indoor Air Branch
U.S. EPA Region 2
290 Broadway
New York, NY 10007-1866

From: [redacted]
To: [redacted]
Cc: [redacted]
Date: 08/16/2010 07:33 AM
Subject: Re: IWCS concerns

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Having carefully reviewed the data and documents, I am in no doubt that the IWCS is leaking. Further, there is no effective system in place for subsurface monitoring of the IWCS.

There are several pieces of evidence of IWCS failure. The most concerning, at this point, is the high level of uranium contamination in groundwater south of the IWCS. USACE have stated that this contamination is pre-existing but, for a number of reasons, I believe that is not the case and that the contamination is being caused by leakage from the IWCS. Passing through this area of contamination is a disused water line, which appears to be acting as a preferential pathway for radioactive contamination to migrate away from the IWCS much faster than predicted.

At the June public meeting USACE confirmed that the NFSS water lines had not been included in the RI investigation and agreed to look into the issue. I have not received any further response from USACE to address this concern and am not aware of any subsequent information provided to the public (if there is please let me know). The feasibility study does not address the contaminated water lines on the NFSS, so how will the extent and nature of the radioactive contamination in the water lines and its impact on the surrounding groundwater be investigated?

The RAB radiological committee will be discussing the detailed evidence of IWCS failure later this week.

[redacted]

In a message dated 8/12/2010 6:17:24 P.M. Central Daylight Time, [redacted]

From [redacted]

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In a message dated 8/17/2010 11:00:42 A.M. Central Daylight Time, [redacted] writes:

Hi [redacted]

Again, and with all due respect, I think you are missing some things....please consider rechecking. I have indicated where you may wish to re-check in bold italics next to your comments.

Further, I believe the USACE is planning on responding to your specific comments shortly, and by that I mean by the end of August. You may wish to

contact John Busse to get a better feel for that. Until then it might be best to wait and see what the actual data the USACE provides indicates.

[redacted]
Radiation & Indoor Air Branch
U.S. EPA Region 2
290 Broadway
New York, NY 10007-1866

From: [redacted]
To: [redacted]
Cc: [redacted]

Date: 08/17/2010 08:35 AM
Subject: Re: IWCS concerns

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Hi [redacted]

I have already checked my work several times, before concluding that the IWCS is leaking - it's too important an issue for me not to be thorough. I have reviewed performance monitoring data (measuring the water levels inside the IWCS), which provided early detection of IWCS integrity problems, and IWCS groundwater monitoring data, which was intended to provide a secondary, albeit delayed system for identifying IWCS integrity problems. Detailed review of both monitoring programs leads me to conclude the IWCS is leaking. I find there is a pattern of abandonment of IWCS monitoring, seemingly in response to unwelcome monitoring results - this applies to performance monitoring and groundwater monitoring of the lower water bearing zone.

There are several inaccuracies in your email. Please allow me to correct.

1) According to Bechtel in 1981, there was no contamination identified in the area immediately south of the IWCS. I attach the relevant page of the survey. The area of concern is immediately east of building 409, where groundwater has been found to contain 958ug/L of dissolved total uranium. Detections of uranium in surface soil and subsurface soil at this location do not correlate with the extremely high levels of uranium currently being detected in the groundwater below. Recheck #1 - The DOE did soil remediation around Building 409 in the 1982-3 and this was after they realized that their 1981 report underestimated the contamination. I believe Figure 3-2 on p 21 of their 1996 report is what you want to refer to. We would conclude that there was significant enough uranium contamination to cause the groundwater contamination levels that were seen.

Limited RI detections of significant surface and subsurface uranium contamination in this area, correlates with the findings of the 1981 Bechtel

survey. This supports the view that uranium groundwater contamination in this area is not pre-existing with respect to the IWCS. Note, the levels of uranium contamination in the groundwater at this location are far in excess of levels previously associated with pre-existing contamination around the IWCS. USACE has evaluated historic photographs which show material stored near building 409 and speculated that the surface storage of these materials has caused the present day groundwater contamination, but has not presented the public with any historic data proving pre-existing contamination of the area around building 409. The historic data is in the Bechtel Report of 1996 as mentioned above. I know the USACE has this report and is aware of this.

2) I am fully aware of the changes USACE have made with respect to their interpretation of groundwater contamination and the reclassification of water in the sewer lines. However, this is irrelevant to my concerns about the 10" water line and associated water line network. The water lines on the NFSS have not been investigated, so there is no data to correct and reissue. This is one of a number of significant data gaps with respect to the IWCS. Recheck #2 While you are correct that the USACE had not investigated water intake mains...the 42" main or the 10" main that you referred to, they did look at the lines that were likely to have contamination which are the ones containing acid waste and sewage. These would be the most likely to have contamination.

3) I think we are talking at cross purposes with respect to the water line. There are two different water intake lines for the LOOW site. The water line I am concerned about is not the 42" process water intake water line you refer to, but the 10" fresh water intake line, which passes close to the south eastern corner of the IWCS. I'm attaching a map taken from the NFSS RI as well as a map taken from a late 1980's NFSS environmental surveillance report. These should clarify the location of the water line of concern. The line just misses the Central Drainage Ditch before intersecting the South 31 ditch and eventually turning north.

The line has not been investigated, so there is no data on the contamination within the line, but it is clear from the recent RI data that groundwater samples taken in the vicinity of this pipeline consistently show significant uranium contamination. The 10" water line feeds into numerous water lines across the NFSS, eventually passing off the NFSS along the northern boundary of the site. I would draw your attention to well OW-11B which lies down gradient of the pipeline and up-gradient of the Central Drainage Ditch. Recent groundwater samples from monitoring well OW-11B, have shown a sharp increase in the levels of uranium present. (See attached plot of uranium detections in well OW-11B.) Recheck #3 No doubt there is an increase in uranium levels in the shallow groundwater monitoring well OW11B. Before we implicate the 10" main as I believe you are concluding take a look at the waste water treatment line which also passes by OW11B and which contained 1300 ug/l of total uranium. I think you have to ask yourself which line is more likely to cause the contamination seen, the waste water line or a line that provided intake water. Also, as I recollect from my last on site visit with our National Air and Radiation Environmental Lab expert, the groundwater flow for the shallow groundwater is in a northwesterly direction. This well in question is 180 feet east of the IWCS and as such is upgradient of the IWCS. From our way of thinking this would be a poor indicator of the IWCS integrity and a better indication of groundwater contamination from

the wastewater line mentioned above. Further, I have talked about this with the USACE staff and I would suggest that there are some wells that are closer and are screened in the shallow water-bearing zone which might be more indicative of the integrity of the eastern side of the IWCS (i.e. 862, A50, A51, and 860). Again, we are not suggesting that all is okay with the groundwater as evident from OW-11B, but we just cannot make a case that it is from the IWCS.

I believe uranium groundwater contamination is much more extensive on the NFSS than has been reported and is largely associated with water line contamination. Recheck #4 I would agree that groundwater contamination is likely to be more extensive than currently indicated by the data as 35+ years of experience always tells me that. I would however, suggest that this is far more likely to be from the sewage lines and not the water lines. We know the sewage lines were contaminated and there is the strongest of suspicions that these have caused groundwater contamination. Well OW-11B is an example of how contamination is spreading out from the IWCS and contaminating the upper water bearing groundwater on site. The Central Drainage Ditch, down-gradient of well OW-11B is known to receive groundwater when the water table is high, so there is the potential for contamination to be moving off site in the surface water, as well as contamination migrating off site along the water lines leaving the NFSS.

I don't think USACE disputes that the 10" water line is intact from the point it passes the IWCS to where the associated water lines leave the NFSS.

I hope this is helpful to EPA in explaining why I still believe the IWCS is leaking. Recheck #5 while clearly we don't agree as to whether OW-11B contamination results from the IWCS or the sewage line adjacent to the well, I thought we agreed at our June meeting that further monitoring of the central drainage ditch should be pursued and that has been communicated to the USACE.

[redacted]

In a message dated 8/16/2010 11:04:38 A.M. Central Daylight Time, [redacted] writes:

Hi[redacted]

I think you need to recheck your work. You may have some faulty assumptions. The contamination you are mentioning as I recollect pre-existed the IWCS as it was noted in a report by Bechtel in 1981 which is before the IWCS was installed. As such that contamination is not indicative of any IWCS failure.

Further, there is some confusion that seems to be occurring in the way people are seeing some of the groundwater data. The USACE used some data from wastewater-sewage lines and reported these as groundwater as a rather conservative measure because one of the lines actually fed into a temporary monitoring well. Again, I think this is material that certainly predates the IWCS. I have in the course of settling on responses to our comments learned that the USACE will be redoing some of their groundwater maps so that ONLY groundwater is included and not something that may have come from a pre-exiting sewage line.

I have no problem with your categorization of the contamination you noted but it isn't likely to be from the IWCS.

The 42" main was given to the Town of Lewiston by the Federal Government around 1971 and plugged or severed between then and 1981....preliminary indications are around 1979, but whatever, before the IWCS was engineered. It is my understanding that the USACE's decision not to sample the 42" main was a direct result of the fact that the main was plugged and was originally used as a forced main to bring clean (so to speak) cooling water from the Niagara River. Again, this is not a conduit for anything offsite from the IWCS as it was closed and sealed [apparently] well before the IWCS was built. Actually, I volunteered EPA to look at the 42" main on behalf of a citizen at the June meeting and the USACE has been giving me their data. They may also be pursuing this too. EPA is in the process of having our attorneys make certain requests for information from the various parties [not USACE] so we have our facts straight on the 42" main and where it was plugged, when and where it was flushed, etc. Please stay tuned on that....we won't be getting answers through this route very quickly.

I certainly agree there is radionuclide contamination outside of the actual IWCS and this needs to be addressed. I, however, do not think that any of this results from the IWCS and that remains the EPA position. When you recheck the chronology of events you may see my point. Let me know if you do not after you have re-reviewed the material.

[redacted]
Radiation & Indoor Air Branch
U.S. EPA Region 2
290 Broadway
New York, NY 10007-1866

From: [redacted]
To: [redacted]
Cc: [redacted]
Date: 08/16/2010 07:33 AM
Subject: Re: IWCS concerns

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Having carefully reviewed the data and documents, I am in no doubt that the IWCS is leaking. Further, there is no effective system in place for subsurface monitoring of the IWCS.

There are several pieces of evidence of IWCS failure. The most concerning, at this point, is the high level of uranium contamination in groundwater south of the IWCS. USACE have stated that this contamination is pre-existing but, for a number of reasons, I believe that is not the case and that the contamination is being caused by leakage from the IWCS. Passing through this area of contamination is a disused water line, which appears to be acting as a preferential pathway for

radioactive contamination to migrate away from the IWCS much faster than predicted.

At the June public meeting USACE confirmed that the NFSS water lines had not been included in the RI investigation and agreed to look into the issue. I have not received any further response from USACE to address this concern and am not aware of any subsequent information provided to the public (if there is please let me know). The feasibility study does not address the contaminated water lines on the NFSS, so how will the extent and nature of the radioactive contamination in the water lines and its impact on the surrounding groundwater be investigated?

The RAB radiological committee will be discussing the detailed evidence of IWCS failure later this week.

[redacted]

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