Issue/Title: Pilgrim Nuclear Power Station (PNPS): Tritium in Groundwater Monitoring Wells

Topic: PNPS Updates as of February 25, 2011

Previous Plans: Results from groundwater monitoring well samples and surface water samples collected during the weeks of January 31st and February 7th, 2011, were reported by Entergy (see tables below). Split samples for the week of January 31st have also been reported by MERL and split samples for the week of February 7th are currently being analyzed by MERL.

Current Status:

Table 1[1]: January 31st

Location	Date	MERL[2] pCi/L	GEL[3] pCi/L
MW 201	1/31/11	889	704
MW 202	1/31/11	-	-
MW 202 I	1/31/11	-	-
MW 203	1/31/11	-	-
MW 204	1/31/11	-	-
MW 205	1/31/11	**1224**	**1080**
MW 206	1/31/11	-	-
MW 207	1/31/11	-	-
MW 208-S	1/31/11	-	-
MW 208-I	1/31/11	-	-
MW 209 **new**	1/31/11	-	-
MW 210 **new**	1/31/11	-	-
MW 211 **new**	1/31/11	-	-
MW 212 **new**	1/31/11	-	-
MW 213 **new**	1/31/11	-	-
MW 214 **new**	1/31/11	-	-
MW 3	1/31/11	-	-
MW 4	1/31/11	-	-
SW-boat ramp	1/31/11	-	-
SW-intake	1/31/11	-	-

Table 2: February 7th

Location	Date	MERL pCi/L	GEL pCi/L
MW 201	2/7/11	**	768
MW 202	2/7/11	**	NDA<333
MW 202 I	2/7/11	**	NDA<333
MW 203	2/7/11	**	**
MW 204	2/7/11	**	**
MW 205	2/7/11	**	**1060**
MW 206	2/7/11	**	**2500**
MW 207	2/7/11	**	**
MW 208-S	2/7/11	**	**
MW 208-I	2/7/11	**	**
MW 209 **new**	2/7/11	**	1280
MW 210 **new**	2/7/11	**	529
MW 211 **new**	2/7/11	**	**
MW 212 **new**	2/7/11	**	628
MW 213 **new**	2/7/11	**	**
MW 214 **new**	2/7/11	**	**
MW 3	2/7/11	**	**
MW 4	2/7/11	**	**
SW-boat ramp	2/7/11	-	-
SW-intake	2/7/11	-	-

*** NDA = not detected at less than activity value listed**
**** results pending**
- not analyzed this week

[1] PNPS screening level for tritium in groundwater monitoring wells is 3,000 pCi/L, which is 1/10th of the NRC-approved Pilgrim Offsite Dose Calculation Manual standard for tritium in non-drinking water sources. The EPA drinking water standard is 20,000 pCi/L. The nearest drinking water wells are approximately 2.5 miles from the plant.

[2] Results from the Massachusetts Environmental Radiation Laboratory (MERL)

[3] GEL Laboratories are a radioanalytical laboratory contracted by PNPS

The latest groundwater monitoring results reported by Entergy show that MW205 increased slightly from 830 pCi/L of tritium detected on January 25th to 1,080 pCi/L of tritium detected on January 31st, and remained about the same at 1,060 pCi/L of tritium detected on February 7th. Results for MW206 decreased slightly from 3,820 pCi/L of tritium detected on January 25th to 2,500 pCi/L detected on February 7th. Groundwater monitoring well MW206 was not able to be sampled during the January 31st sampling round due to a frozen well head and ice in the area preventing safe access to the well. Results for MW201 have been trending lower than previous sampling rounds when tritium was detected at approximately 1000 pCi/L, with 704 pCi/L tritium detected on January 31st, and 768 pCi/L detected on February 7th. For the weeks of January 31st and February 7th, Entergy reported they were not able to collect surface water samples because the ice conditions presented a physical hazard. MERL has also reported their final sampling results for the week of January 31st, which are summarized in the table. MERL results were again generally consistent with those reported from Entergy.

An unplanned shut down occurred at PNPS beginning February 19th that lasted for approximately 78 hours. The shut-down was necessary to address a small amount of salt water intrusion that was detected in a closed cooling water system. Specifically, on Friday night, February 18th the leakage limits in the cooling system water exceeded their monitoring limit, which triggered a shut down that occurred Saturday night February 19th. During the shut-down, Entergy located and repaired a small leak of salt water entering into a heat exchanger unit, and after approximately 78 hours the plant came back online and is currently operating at 100% capacity. The salt water intrusion did not pose any health or safety risk to workers or the surrounding environment.

The dye testing is proceeding as planned at PNPS. Dyes were introduced in three possible source locations in mid-January. The fourth dye was introduced into the French drain system near the condensate storage tanks (CST) in mid-February. The primary purpose of injecting the 4th dye into the CST French drain system is to learn more about the specific groundwater flow patterns in this area of the plant should a leak

in the CST system occur sometime in the future. Charcoal bags designed to detect the dyes continue to be collected from the groundwater monitoring wells (and replenished) on a weekly basis. The charcoal samplers are being collected weekly to determine whether the dyes are present in the groundwater, although this is not expected to occur in most wells for several months or more due to the slow rate of groundwater flow. Entergy has reported that no dyes were detected in the first set of results they recently received from the dye testing company. Entergy will begin reporting dye testing results to MDPH and MEMA on a regular basis similar to their reporting of groundwater and surface water monitoring results as data become available.

The vacuum soil extraction and collection of soil samples in the vicinity to MW205 and MW206 was completed on February 24th. Seven soil samples were collected from three locations at varying depths near MW205. At two locations near MW205 soil samples were collected at depths of 5, 10 and 15 feet; at the third location a sample was collected at the 5 foot depth only, as underground facility components obstructed any deeper soil extraction. Nine soil samples were collected near MW206 from three locations at depths of 5, 10 and 15 feet. MDPH will report the soil sampling results when they become available from Entergy. Similar to groundwater and surface water samples, split soil samples have been set aside and will be shared with MERL for an independent analysis.

The third party review report of the ultrasonic testing and the guided wave tests on the CST line has been reviewed by Entergy's engineering group, and the final report will be made available to MDPH and MEMA for on-site review in the next few weeks. As previously noted, Entergy has reported that results from the 3rd party review indicate no significant anomalies that would suggest a source for the tritium in groundwater. Also, while ultrasonic testing is considered a standard tool in the nuclear industry, guided wave testing is new to the industry and the NRC does not recognize it as an established tool for determining leaks, but considers it a piece of data in the overall picture.

Looking Forward:

Snow tritium sampling results are expected to be available from Entergy with the next set of data.

MDPH will coordinate with MEMA to review the third party report at PNPS and take another site tour.

MPDH and MEMA have been working with Entergy on a revised groundwater sampling schedule that will commence beginning in March. Specifically, priority wells MW201, MW205, and MW206 will continue to be sampled on a weekly basis along with the addition of MW209 and MW211. MW209 was added due to its location up gradient from MW205, and MW211 was added due to its proximity to a rarely used permitted discharge line. All other groundwater monitoring wells and surface water samples will be collected on a monthly schedule based on the stable and consistent tritium results at these sampling locations established through regular monitoring over the past year. If any elevated tritium is detected at any of the monitoring wells with a monthly sampling schedule, the sampling frequency for those wells will be revisited.