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

Topic: PNPS Updates as of December 12, 2011

Previous Plans: Results from groundwater monitoring well samples collected during the weeks of November 15th and November 22nd, 2011 were reported by Entergy. Split sample results for the weeks of November 15th and November 22nd, 2011 have also been reported by MERL.

Current Status:

Table 1[1]: November 15th

Location	Date	MERL[2] pCi/L	GEL[3] pCi/L
MW 201	11/15/2011	596	967
MW 202	11/15/2011	-	-
MW 202 I	11/15/2011	-	-
MW 203	11/15/2011	-	-
MW 204	11/15/2011	-	-
MW 205	**11/15/2011**	**3,583**	**2,880**
MW 206	**11/15/2011**	**1,890**	**1,960**
MW 207	11/15/2011	-	-
MW 208-S	11/15/2011	-	-
MW 208-I	11/15/2011	-	-
MW 209 **new**	11/15/2011	1,474	1,180
MW 210 **new**	11/15/2011	-	-
MW 211 **new**	11/15/2011	1,576	1,010
MW 212 **new**	11/15/2011	-	-
MW 213 **new**	11/15/2011	-	-
MW 214 **new**	11/15/2011	-	-
MW 3	11/15/2011	-	-
MW 4	11/15/2011	-	-
SW-boat ramp	11/15/2011	-	-
SW-intake	11/15/2011	-	-

Table 2: November 22nd

Location	Date	MERL pCi/L	GEL pCi/L
MW 201	11/22/2011	-	-
MW 202	11/22/2011	-	-
MW 202 I	11/22/2011	-	-
MW 203	11/22/2011	-	-
MW 204	11/22/2011	-	-
MW 205	**11/22/2011**	**8,644**	**6,790**
MW 206	**11/22/2011**	**2,344**	**3,050**
MW 207	11/22/2011	-	-
MW 208-S	11/22/2011	-	-
MW 208-I	11/22/2011	-	-
MW 209 **new**	11/22/2011	1,320	1,080
MW 210 **new**	11/22/2011	-	-
MW 211 **new**	11/22/2011	1,487	1,260
MW 212 **new**	11/22/2011	-	-
MW 213 **new**	11/22/2011	-	-
MW 214 **new**	11/22/2011	-	-
MW 3	11/22/2011	-	-
MW 4	11/22/2011	-	-
SW-boat ramp	11/22/2011	-	-
SW-intake	11/22/2011	-	-

*** NDA = not detected at less than activity value listed**
**** results pending**
***** well inaccessible due to scheduled equipment use**
- 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 MW205 decreased to a level of 2,880 pCi/L of tritium detected on November 15th and increased to 6,790 pCi/L of tritium detected on November 22nd (the previous result on November 8th was 3,840 pCi/L). Results for MW206 decreased to 1,960 pCi/L of tritium detected on November 15th and increased to 3,050 pCi/L of tritium detected on November 22nd (3,380 pCi/L of tritium was detected in the previous sample on November 8th). Results for MW201 indicated 967 pCi/L of tritium detected on November 15th. No results were available for MW201 for November 22nd, as the well was inaccessible for sampling due to the presence of standing water. Results for MW209 indicated 1,180 pCi/L of tritium detected on November 8th, and 1,080 pCi/L of tritium detected on November 22nd. For MW211, 1,010 pCi/L of tritium was detected on November 15th, and 1,260 pCi/L of tritium was detected on November 22nd. Split sample results from MERL for the weeks of November 15th and November 22nd, 2011 were generally consistent with results reported by Entergy (see table above).

As previously reported, the charcoal samplers placed in monitoring wells for the dye testing effort continue to be collected. Because no dye has been detected in any sample since the dye testing began in January 2011, dye test sampling is now being done every two weeks instead of weekly, at least until dye is detected in any sample. In that case, weekly sampling will resume. MDPH expressed concerns about the long-term viability of the dye, since it is approaching a year since the dye was introduced. Entergy reported that they confirmed with their dye testing consultant that the dye is still viable and would still be detectable if a sampler encounters the dye.

As previously reported, Entergy is currently evaluating several new investigation activities to help identify the cause of the tritium detections in groundwater at PNPS. Entergy has drafted a list of these proposals. They include: placing dyes directly into wells (and hence, the groundwater) to better characterize groundwater flow, installation of new wells in the vicinity of the radwaste discharge line, collection of soil samples near the radwaste discharge line, reactor building concrete sampling, and possibly taking the

radwaste discharge line temporarily out of service and/or re-routing it. Currently, Entergy is moving forward with installation of new groundwater monitoring wells and collection of new soil samples. Entergy will also be providing a detailed summary of each of the new investigation activities in a document that will be shared with MDPH and MEMA for review and input.

As previously reported, Entergy and their consultant ERM met to discuss and walk through possible locations for new groundwater monitoring wells. MDPH was invited to observe the meeting between Entergy and ERM and participate in the site walk. Areas of interest for possible new wells were focused close to the deep foundations of the reactor and turbine buildings, as it is believed that groundwater is diverted around these structures and flows along the deep foundations. Potential leaks from underground systems such as the augmented off-gas system, radwaste discharge line, or neutralization sump discharge will be investigated by these new wells. Recently, Entergy has reported that three well locations have been selected in these areas. Vacuum excavators were on site the week of December 5th. Two wells have been excavated. Entergy reports that these two wells should be fully in place by the week of December 12th, and Entergy's goal is to begin sampling them the week of December 19th. The third well is currently on hold for technical reasons. Entergy will also be providing a map to MDPH and MEMA of the exact locations and a summary of the rationale for placing each well. These wells will help to better characterize the possible origin of tritium in groundwater.

While the new wells are being installed, soil samples will also be collected at 5 foot intervals down to the water table at each of the three new groundwater well locations. MDPH has requested that Entergy provide split soil samples to MERL for analysis and Entergy has agreed.

MDPH has requested that Entergy send a matrix summarizing specific dates the underground systems such as the radwaste discharge line and neutralization sump discharge have been used over the past few years. This information may be helpful in

interpreting tritium results for the newly installed wells. Entergy reported they will provide this information to MDPH.

MDPH, MEMA, and Entergy have also been discussing the frequency of groundwater and surface water sample collection. Based on the consistency of results for non-priority wells and surface water samples over the past year and a half and in an effort to focus future investigations on priority wells and the newly installed wells, it was agreed that the non-priority wells and surface water samples can move from a monthly sampling schedule to a quarterly schedule. At this time, priority wells will continue to be sampled weekly.

Entergy reported that the Director of Nuclear Safety Assurance position at PNPS previously vacated by Steve Bethay has been filled by AlDodds, who comes from Arkansas Nuclear One (ANO) and has 30 years of experience in the industry.

Looking Forward:

MDPH continues to reach out to radiation control program contacts in other states to be aware of tritium in groundwater monitoring programs at other nuclear power plants across the U.S. and learn any information that may be applicable to groundwater investigations at PNPS.

MDPH and MEMA plan to review Entergy's proposed next steps in the tritium investigation and will provide feedback once a more detailed summary document of the new investigation activities is provided by Entergy.

MDPH will continue to closely follow any new investigation activities that are currently moving forward (i.e. well placement and soil sampling).