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

Topic: PNPS Updates as of January 6, 2012

Previous Plans: Results from groundwater monitoring well samples collected during the weeks of December 6th and December 13th, 2011 were reported by Entergy. Split sample results for the weeks of December 6th and December 13th, 2011 have also been reported by MERL.

Current Status:

Table 1[1]: December 6th

Location	Date	MERL[2] pCi/L	GEL[3] pCi/L
MW 201	12/06/2011	424	NDA
MW 202	12/06/2011	-	-
MW 202 I	12/06/2011	-	-
MW 203	12/06/2011	-	-
MW 204	12/06/2011	-	-
MW 205	**12/06/2011**	**7,758**	**6,860**
MW 206	**12/06/2011**	**3,307**	**3,730**
MW 207	12/06/2011	-	-
MW 208-S	12/06/2011	-	-
MW 208-I	12/06/2011	-	-
MW 209 **new**	12/06/2011	1,272	1,010
MW 210 **new**	12/06/2011	-	-
MW 211 **new**	12/06/2011	1,281	1,200
MW 212 **new**	12/06/2011	-	-
MW 213 **new**	12/06/2011	-	-
MW 214 **new**	12/06/2011	-	-
MW 3	12/06/2011	-	-
MW 4	12/06/2011	-	-
SW-boat ramp	12/06/2011	-	-
SW-intake	12/06/2011	-	-

Table 2: December 13th

Location	Date	MERL pCi/L	GEL pCi/L
MW 201	12/13/2011	414	419
MW 202	12/13/2011	-	-
MW 202 I	12/13/2011	-	-
MW 203	12/13/2011	-	-
MW 204	12/13/2011	-	-
MW 205	**12/13/2011**	**2,739**	**2,550**
MW 206	**12/13/2011**	**3,949**	**5,050**
MW 207	12/13/2011	-	-
MW 208-S	12/13/2011	-	-
MW 208-I	12/13/2011	-	-
MW 209 **new**	12/13/2011	1,280	1,290
MW 210 **new**	12/13/2011	-	-
MW 211 **new**	12/13/2011	1,296	1,330
MW 212 **new**	12/13/2011	-	-
MW 213 **new**	12/13/2011	-	-
MW 214 **new**	12/13/2011	-	-
MW 3	12/13/2011	-	-
MW 4	12/13/2011	-	-
SW-boat ramp	12/13/2011	-	-
SW-intake	12/13/2011	-	-

*** 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 increased to a level of 6,860 pCi/L of tritium detected on December 6th and decreased to 2,550 pCi/L of tritium detected on December 13th (the previous result on November 29th was 3,530 pCi/L). Results for MW206 increased to 3,730 pCi/L of tritium detected on December 6th and increased again to 5,050 pCi/L of tritium detected on December 13th (3,060 pCi/L of tritium was detected in the previous sample on November 29th). Notably, Entergy's December 13th, 2011 results for MW206 were the highest tritium results in this well since December 29th, 2010 when 8,950 pCi/L of tritium was detected. Results for MW201 indicated no detectable tritium on December 6th, and 419 pCi/L of tritium detected on December 13th. Results for MW209 were 1,010 pCi/L of tritium detected on December 6th, and 1,290 pCi/L of tritium detected on December 13th. For MW211, 1,200 pCi/L of tritium was detected on December 6th, and 1,330 pCi/L of tritium was detected on December 13th. Split sample results from MERL for the weeks of December 6th and December 13th, 2011 were generally consistent with results reported by Entergy (see table above).

The charcoal samplers placed in monitoring wells for the dye testing effort continue to be collected. No dye has been detected in any sample since the dye testing began in January 2011. Dye test sampling will be done every two weeks until dye is detected in any sample. Once dye is detected, weekly sampling will resume.

Entergy and their consultant have excavated and installed two new wells (MW215 and MW217). These new wells were in place and sampled on December 22nd, 2011. Samples are currently being analyzed by Entergy's contract laboratory and MDPH's MERL will be analyzing split samples once they receive them from Entergy. Well installers encountered technical difficulties in digging a planned third new well up gradient from MW206 (e.g., extensive underground concrete). This week Entergy's technical team met with ERM and proposed several new locations that may be feasible for placing this third new well up gradient of MW206 and close to the deep foundation of the reactor building. Ground penetrating radar is required be used to confirm these

locations as viable alternatives, however, these locations are currently under storage containers that must be relocated to gain access to the proposed area. Entergy is working on plans to relocate these containers after which a plan and schedule for initiating ground penetrating radar and if clear of sub-surface interferences well installation efforts can proceed. MDPH and MEMA will receive weekly updates on the progress of installing the third new well and a map of the proposed locations. Entergy will also be providing a well installation report on MW215 and MW217 to MDPH and MEMA, which will include installation details and a map once their consultant, ERM, has finished preparing their report, which MDPH hopes to receive by the end of January. These new wells are designed to evaluate the possibility that tritium may originate from the radwaste discharge line and contaminated groundwater is flowing around the deep foundation of the reactor building towards MW205 and MW206 on either side of the building.

Soil samples were also collected at 5 foot intervals down to the water table at each of the new groundwater well locations. Soil samples are also currently being analyzed by Entergy's contract laboratory and MERL will be analyzing split samples once they receive them from Entergy.

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 that a final draft is ready and should be provided to MDPH and MEMA shortly.

MDPH, MEMA, and Entergy have continued discussing the frequency of groundwater and surface water sample collection**.** With the addition of the newly installed wells, it was agreed that the 5 priority wells and MW215 and MW217 could move to a bi-weekly sampling schedule after four consecutive weeks of sampling, provided there are no unusual patterns of tritium in groundwater detected in the new wells. When the third new well, MW216, is able to be installed, it will also be sampled weekly for 4

consecutive weeks prior to moving to the bi-weekly priority well schedule, again, assuming no unusual patterns upon review of the data. Also, similar to the frequency of sampling for priority wells, the surface water sample in the intake canal downstream of MW205 will be sampled for 4 consecutive weeks and then move to a biweekly schedule along with the other wells pending a review of the data. As previously reported, 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.

Looking Forward:

A meeting between Entergy and agency staff including MDPH, MEMA, MDEP, and NRC is in the early planning stages. Agency staff will be notified shortly about possible meeting dates.

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

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 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.