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

Topic: PNPS Updates as of September 30, 2010

Previous Plans: Results from groundwater monitoring well samples and surface water samples taken during week of September 13, 2010, were reported by Entergy (see table below). Splits of these samples are currently being analyzed by the MDPH MERL lab.

Current Status:

Table 1[1]: September 7th

Location	Date	MERL[2] pCi/L	GEL[3] pCi/L
MW 201	9/7/2010	1492	1200
MW 202	9/7/2010	513	352
MW 202 I	9/7/2010	407	417
MW 203	9/7/2010	356	375
MW 204	9/7/2010	654	455
MW 205	**9/7/2010**	**3070**	**3010**
MW 206	**9/7/2010**	**4551**	**3190**
MW 207	9/7/2010	342	329
MW 208-S	9/7/2010	NDA<300	NDA<295
MW 208-I	9/7/2010	334	NDA<304
MW 209 **new**	9/7/2010	1774	1560
MW 210 **new**	9/7/2010	581	589
MW 211 **new**	9/7/2010	1503	1570
MW 212 **new**	9/7/2010	613	655
MW 213 **new**	9/7/2010	376	341
MW 214 **new**	9/7/2010	NDA<300	NDA<297
MW 3	9/7/2010	NDA<300	NDA<331
MW 4	9/7/2010	672	662
SW-boat ramp	9/7/2010	NDA<300	NDA<326
SW-intake	9/7/2010	NDA<300	NDA<328

Table 2: September 13th

Location	Date	MERL pCi/L	GEL pCi/L
MW 201	9/13/2010	**	1510
MW 202	9/13/2010	**	461
MW 202 I	9/13/2010	**	652
MW 203	9/13/2010	**	**
MW 204	9/13/2010	**	**
MW 205	**9/13/2010**	******	**1840**
MW 206	**9/13/2010**	******	**6830**
MW 207	9/13/2010	**	**
MW 208-S	9/13/2010	**	**
MW 208-I	9/13/2010	**	**
MW 209 **new**	9/13/2010	**	1590
MW 210 **new**	9/13/2010	**	641
MW 211 **new**	9/13/2010	**	1730
MW 212 **new**	9/13/2010	**	618
MW 213 **new**	9/13/2010	**	**
MW 214 **new**	9/13/2010	**	**
MW 3	9/13/2010	**	**
MW 4	9/13/2010	**	**
SW-boat ramp	9/13/2010	**	**
SW-intake	9/13/2010	**	**

*** NDA = not detected at less than activity value listed**

**** results pending**

The most recent results (September 13) demonstrate a decrease in tritium concentrations in MW-205 and an increase in tritium in MW-206 from results of the week of September 7th. For MW-205 the level was 1840 pCi/L (down from 3010 pCi/L on September 7th) and for MW-206 the level was 6830 pCi/L (up from the previous measurement of 3190 pCi/L). While the tritium levels in most groundwater wells have

[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

remained generally consistent over time, the fluctuation in tritium concentrations in groundwater wells MW-205 and MW-206 in particular continues to be difficult to interpret.

Through discussions with DPH, MEMA, DEP staff as well as Entergy, it is clear that other investigation activities in addition to groundwater sampling will help provide a better understanding of why higher levels of tritium have been detected in MW-205 and MW-206. Recently, discussions with Entergy support the utility moving forward with dye testing efforts. They have been working with a dye testing company to develop a test plan for using this method to investigate the radiological waste discharge line as a possible tritium source to groundwater. This line is the best candidate for this type of investigation because, due to technical and safety reasons, they are unable to isolate this line to conduct hydro pressure tests (i.e. segments of this line are underwater and inaccessible during normal plant operations). This technique involves inserting dyes into various piping systems that feed into this line before it discharges to the discharge canal. As previously mentioned, the first step will be the collection of baseline data from the test area to provide a before and after comparison. Part of the dye testing plan also includes ensuring that discharge of the dye itself to the discharge canal does not pose any environmental violations.

In response to a request from MDPH, Entergy and their hydrology consultants continue to evaluate the potential influence of rainwater on tritium concentrations in groundwater, particularly in MW-206. Once the next significant rainfall event occurs, they plan to collect samples from rainwater draining off the Reactor Building roof via a drain pipe that goes through Manhole-9 and near MW-206 before discharging into the intake canal at permitted Outfall 006. In addition, Entergy has reported that they are working with their hydrogeological consultants to carefully monitor groundwater depth fluctuations in all monitoring wells and potential tidal influences at MW-206 in particular. Concurrently, they are also continuing to carefully monitor the timing of all facility operations to determine any potential relationships to levels of tritium detected in groundwater wells.

As previously reported, given the number of wells and frequency of testing, the labs are having difficulty keeping up with the number of samples to analyze on a weekly basis. In an effort to prioritize resources and further support supplemental activities that are hoped to provide more timely information (e.g. dye testing, additional investigations of the potential influences of rainwater, etc.), MDPH recommended prioritizing certain wells for continued weekly sampling and reducing the frequency of groundwater sampling for some others. This week, MDPH and MEMA worked with Entergy to develop a sampling schedule that will resources in such a way that the potential source of tritium can be identified in the near term. Specifically, collection of weekly samples will continue for groundwater wells of particular interest (e.g., MW-201, MW-205, MW-206, and others that may become of interest in the future) and the two surface water sample locations (which to date have had no detections of tritium). Sampling of the remaining groundwater monitoring wells for which results have remained generally consistent between labs and over time will move to a bi-weekly schedule. A full round of all groundwater monitoring wells and two surface water locations were collected this

week (September 27th/28th), and the groundwater wells of particular interest (MW-201, MW-205, MW-206) and two surface water locations will be sampled next week (October 4th). Then, a complete round of all groundwater monitoring wells and two surface water locations will be sampled the following week (October 11th), and so on. MDPH reviewed this plan with MDEP staff who concurred that prioritization of new activities and reduction in frequency of sampling for some wells was an optimal plan. Agency representatives will revisit on a weekly basis (based on lab results) if there is a need to move additional groundwater monitoring wells to a weekly sampling schedule. MDPH anticipates additional sampling results by Friday of this week, and the new information will be reported on in next week's update.

Looking Forward:
A site visit that will include MDPH, MEMA and MDEP is currently scheduled for Friday, October 15, 2010. A draft agenda is currently being compiled for review by all agencies prior to the meeting that will include detailed updates on groundwater investigations provided by Entergy and their hydrogeology consultants, investigations of different plant systems, and a site tour.