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

Topic: PNPS Updates as of September 3, 2013

Previous Plans: Results from groundwater monitoring well samples collected during the weeks of July 22, 2013 and August 5, 2013 were reported by Entergy. Split sample results for the weeks of July 22, 2013 and August 5, 2013 were also reported by MERL.

Current Status:

Table 1[1]: Week of July 22nd

Location	Date	MERL pCi/L	GEL pCi/L
MW 201	07/22/2013	NDA(300)*	NDA(414)*
MW 202	07/22/2013	-	-
MW 202 I	07/22/2013	-	-
MW 203	07/22/2013	-	-
MW 204	07/22/2013	-	-
MW 205	07/22/2013	1,379	1,190
MW 206	07/22/2013	NDA(300)*	NDA(411)*
MW 207	07/22/2013	-	-
MW 208-S	07/22/2013	-	-
MW 208-I	07/22/2013	-	-
MW 209	07/22/2013	528	672
MW 210	07/22/2013	-	-
MW 211	07/22/2013	1,003	849
MW 212	07/22/2013	-	-
MW 213	07/22/2013	-	-
MW 214	07/22/2013	-	-
MW 215	07/22/2013	793	647
MW 216	07/22/2013	4,882	3,790
MW 217	07/22/2013	-	-
MW 3	07/22/2013	-	-
MW 4	07/22/2013	-	-
SW-boat ramp	07/22/2013	-	-
SW-intake	07/22/2013	NDA(300)*	NDA(414)*

Table 2: Week of August 5th

Location	Date	MERL pCi/L	GEL pCi/L
MW 201	08/05/2013	NDA(300)*	NDA(363)*
MW 202	08/05/2013	-	-
MW 202 I	08/05/2013	-	-
MW 203	08/05/2013	-	-
MW 204	08/05/2013	-	-
MW 205	08/05/2013	NDA(300)*	NDA(365)*
MW 206	08/05/2013	NDA(300)*	NDA(366)*
MW 207	08/05/2013	-	-
MW 208-S	08/05/2013	-	-
MW 208-I	08/05/2013	-	-
MW 209	08/05/2013	548	590
MW 210	08/05/2013	-	-
MW 211	08/05/2013	1,020	1,120
MW 212	08/05/2013	-	-
MW 213	08/05/2013	-	-
MW 214	08/05/2013	-	-
MW 215	08/05/2013	1,072	1,130
MW 216	08/05/2013	5,307	4,690
MW 217	08/05/2013	-	-
MW 3	08/05/2013	-	-
MW 4	08/05/2013	-	-
SW-boat ramp	08/05/2013	-	-
SW-intake	08/05/2013	NDA(300)*	NDA(357)*

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

- 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.

The groundwater monitoring results reported by Entergy show MW205 decreased to a level of 1,190 pCi/L of tritium detected during the week of July 22nd, and no tritium was detected during the week of August 5th (the previous result during the week of July 8th was 3,090 pCi/L). Entergy results show that for the weeks of July 22nd and August 5th no tritium was detected in MW206 (the previous result during the week of July 8th also indicated no detectable tritium). Weekly sampling results for MW216, MW209, and MW211 are discussed below. Results for most other wells sampled during the weeks of July 22nd and August 5th were within typical ranges detected since the groundwater monitoring for tritium began. MERL split sample results for the weeks July 22nd and August 5th were generally consistent with Entergy's results.

Since its installation in September 2012, MW216 has been sampled weekly. MW216 is currently trending higher than most other groundwater monitoring wells on site. The most recent Entergy results for MW216 indicated 4,690 pCi/L of tritium detected the week of August 5, 2013 and 4,290 pCi/L of tritium detected the week of August 12, 2013. MERL split sample results for MW216 for the weeks of August 5, 2013 were generally consistent with Entergy's results and split sample results for the week of August 12, 2013 are currently being analyzed by MERL. As previously noted, potential sources of tritium in groundwater in the area of MW216 include roof drain run off, the radwaste discharge line, the residual effects of a historical spill in the area (that Entergy reported was remediated at the time of the spill), or a possible connection to the neutralization sump discharge line (which was confirmed to be separated) on the other side of the reactor building via a duct bank.

MW209 and MW211 are also currently being sampled weekly following the discovery of the separation in the neutralization sump discharge line earlier this year. Weekly results for MW209 and MW211 appear to be trending slightly with MW216. The most recent Entergy results for MW209 indicated 590 pCi/L of tritium detected the week of August 5, 2013 and 893 pCi/L of tritium detected the week of August 12, 2013. The most recent Entergy results for MW211 indicated 1,120 pCi/L of tritium detected the week of August 5, 2013 and 1,120 pCi/L of tritium detected the week of August 12, 2013. MERL split

sample results for MW209 and MW211 for the week of August 5, 2013 were generally consistent with Entergy's results and split sample results for the week of August 12, 2013 are currently being analyzed by MERL.

Entergy surface water sampling results for the intake canal downstream of MW205 for the weeks of July 22nd and August 5th indicated no detectable tritium. MERL split sample results for tritium in surface water for the weeks of July 22nd and August 5th were also non-detect.

As previously described, the neutralization sump discharge line, which serves as a permitted discharge line to the discharge canal, was separated below grade. Soil samples were collected the week of July 15th from excavations down to the pipe in three locations along the discharge line (i.e. at the separation, approximately 10 feet from catch basin 10 [CB10], and at CB10). The soil samples have been shipped to Entergy's lab to be analyzed for gamma radionuclides (i.e. in pCi/kg), for tritium, and for hard-to-detects (e.g., strontium-90). Split soil samples are being be sent to MERL for analysis. Entergy has reported that preliminary analyses indicate the presence of tritium in soil at the separation excavation, but quantitative analyses have not yet been completed. MDPH will report soil sampling results in a future update once they are received from Entergy.

As previously reported, Entergy indicated that water from the neutralization sump discharge line typically contained nitrates/nitrites. Entergy developed a sampling program for these constituents that began in April 2013. Entergy reported that no nitrate/nitrite levels above background have been detected in monitoring wells downstream of the neutralization sump discharge line to date.

The ongoing investigation of the neutralization sump discharge line includes plans to install two new groundwater monitoring wells, one near the area of the separation to be installed between MW211 and the reactor building auxiliary bay, and another near CB-10. Transducers are also being considered for these wells and some existing wells

when the new wells are installed. Also, Entergy plans to replace MW4 with a deeper well which will make it more consistent with the other groundwater monitoring wells on site. Entergy's contractor continues to evaluate all available information to determine if the neutralization sump discharge line separation can explain some of the historical tritium levels detected in existing groundwater monitoring wells.

Looking Forward:

MDPH will continue to closely follow all investigational activities that are currently underway at PNPS, notably any developments concerning the neutralization sump discharge line and the planned installation of new wells.