State of New Jersey
DEPARTMENT OF ENVIRONMENTAL PROTECTION

JON S. CORZINE
Governor

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LISA P. JACKSON
Commissioner

May 29, 2007

Mr. Zigmund A. Karpa
Director, Environmental Programs
Exelon Generation
200 Exelon Way
KSA 3-E
Kennett Square, PA 19348

Dear Mr. Karpa:

The Exelon Generation Company, LLC "Hydrogeologic Investigation Report" (CRA Report) for the Oyster Creek Nuclear Generating Station (OCNGS), prepared by Conestoga-Rovers and Associates (CRA), has been reviewed by staff from the Bureau of Nuclear Engineering (BNE) and by staff from the New Jersey Geologic Survey (NJGS). Specific comments by the BNE and the NJGS are attached.

Overall, the CRA Report does not provide any information on historic releases from the site. Elevated tritium results were reported in several onsite wells as noted in your Annual Radiological Environmental Monitoring Reports (REMP) for 1989 and 1990, yet there is no mention of these results in the CRA Report. Were there any releases of tritiated water or steam between 1987 and 2000 which could account for the levels found in the original monitoring network? Historic releases at Oyster Creek need to be documented as an appendix to the CRA Report to see whether or not they account for the tritium results noted in the Annual REMP Reports and original monitoring network.

In order to give an accurate assessment of the water table and ground water flow of the site, one set of water level measurements is not enough for developing trends to assess potential radiological impact in this region. Other recognized reports on groundwater characterization at Oyster Creek and Forked River have used multiple sampling dates, such as the study performed by Woodward-Clyde Consultants in 1984. Since there is insufficient data to accurately assess groundwater flow in the wetlands area along the discharge and intake canals, the BNE cannot be assured of an accurate assessment of groundwater flow within the various aquifers based on the existing number of data points in certain locations along the canals. The BNE is requesting that the following be considered: (a) set measuring points in the wetlands so water elevations could be taken there; (b) set measuring points for surface water levels near the intake and discharge structures and (c) a recommended Cape May and Cohansey well cluster installed adjacent to both the intake and discharge canals near the surface water measuring points.

Shallow wells in the wetlands areas would suffice. Measuring points are to be driven 5 feet below first water to act as measuring indicators for water elevation and wells should be surveyed. Once a more accurate evaluation of the water table and groundwater flow is determined, the appropriateness of the well locations, and whether or not additional wells may be needed can be determined.

As indicated by Well W-14, in the 1989 –1990 reports, there is a possibility for tritium, if it gets below the "Upper Clay" to flow down gradient to the east, where public/private wells exist. Further, there are approved ground water diversions on and around the site that, if pumped at approved rates, could change the gradient flow and pathways in all aquifers. Exelon needs to be cognizant of the potential change to groundwater flow in the event of increased (or decreased) diversion of water, and consider updating its assessment of groundwater flow on a somewhat regular basis.

Monitoring wells should be considered along the eastern boundary of the Owner Controlled Area in the Cape May and Cohansey aquifers. The reason for this recommendation is based on groundwater flow patterns in the Cohansey aquifer and the close proximity of the dredge spoils (Upland Confined Disposal Area) to residential areas such as Clune Park and the Forked River residential development to the east. According to the CRA report, groundwater flow direction in the Cohansey aquifer is to the east of the dredge spoils. There could be potential offsite leaching of activity from the Upland Confined Disposal Area, especially if Exelon decides to utilize the confined spoils area for future canal spoils as a result of additional dredging. It should be noted, however, that for over 10 years, the OCNGS has been a zero liquid discharge facility. While spoils activity would be at the surface, a report by Jersey Central Power and Light from 1980 suggests that shallow confining clay zones are thin, not extensive, and at times absent. This could lead to vertical transfer between the Cape May and Cohansey aquifers.

Lastly, the CRA Report also indicates that the iso-condenser vents located on the eastern side of the reactor building are a potential source of release of radioactivity to the environment. The nearest wells in the area are well MW-1A-1A near the stack to the south and east of the iso-condenser vent, and wells W-14 and W-15, located to the north and east between the reactor building and the materials warehouse. As has been noted, there has been documented tritium activity in Well W-14 near the warehouse from September 1989 through September 1990. In order to monitor any potential release to the environment from the iso-condenser, a monitoring well just east of the vents between the reactor Building and the old radwaste building should be considered.

If you wish to discuss our assessment, please feel free to contact me to arrange a meeting with my staff and the NJGS at (609) 984-7700.

Sincerely yours,

Kent W. Tosch, Manager
Bureau of Nuclear Engineering

Attachments

c: Jill Lipoti, Director, Division of Environmental Safety & Health
Paul Balduaf, Assistant Director, Radiation Protection & Release Prevention
Richard Dalton, NJGS
Karen Tuccillo, Supervisor, Nuclear Environmental Engineering Section, BNE
Paul E. Schwartz, Nuclear Environmental Engineering Section, BNE

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COMMENTS FROM THE BUREAU OF NUCLEAR ENGINEERING

General

The onsite well monitoring network should be incorporated into the REMP. This item has been discussed as part of re-licensing commitments.

3.3.2.2 Radiological Investigation

Does the site have a documented 50.75(g) file for the purposes of potential decommissioning? The recommendation is a formal list of historic spills at the site (50.75(g)) should be included in this report.

3.4 Identified Areas for Further Evaluation

The report identified the Isolation-Condenser vents as an **Area for Further Evaluation (AFE)** on the Oyster Creek site. Based on the potential for a steam release, prevailing wind direction, condensation and runoff into the ground directly below the vents should warrant the need for a sampling well to be located in this general area. The nearest existing wells are (1) Wells W-14 and W-15, located north and east of the Isolation-Condenser vents adjacent to the Warehouse (approximately 200 feet away) and (2) Wells MW-1A-1A and MW-1A-2A, located south and east of the Isolation-Condenser vents and adjacent to the boiler house (approximately 100 feet away). It is recommended that a well be placed in the Cohansey aquifer adjacent to the reactor building directly below the Isolation-Condenser Vents. As per Section 9.1, **Fill Data Gaps.**

3.5 Identified Areas for Further Evaluation

Historically, the Station has utilized an **evaporator** to reduce potentially contaminated water. For example, excess water due to flooding that potentially migrates into contaminated are as must be dealt with as radiological waste. The evaporator, which runs off the **Auxiliary Boiler**, heats potentially contaminated water and reduces liquid waste and its associated disposal costs (as the Station is a zero-discharge facility).

With the potential for contamination to become airborne, should the evaporation process be considered a source of potential release into the environment, thus being considered an AFE?

4.1 Well Inventory – Administrative

Oyster Bay Restaurant is now known as **Charlie Brown's Restaurant,** and,
Arven Limo Services is now known as **The Shark Fin Inn Restaurant**.

5.1.4 Lateral Groundwater Flow and Velocity

The report states that in the Cape May aquifer, the contour spacing and the groundwater flow direction are not uniform. Does this have anything to do with the smaller number of data points (and wells) along the south side within the horseshoe, thus affecting the true behavior of the horizontal hydraulic gradient? Additional monitoring points in this aquifer should be added in the wetlands area on the intake side as well. This is important as the shallow aquifers flow directly into the surface water (canals).

9.0 Recommendations

If the "Upland Confined Disposal Area" (aka dredge spoils area) is to be used for spoils storage during future dredging of the intake and discharge canals, it seems logical that, based on groundwater flow, several wells be constructed in both the Cape May and Cohansey aquifers to the east of the disposal area, along with an additional surface water sampling point located near the boat slip south and east of the disposal area. The boat slip area could potentially be in proximity to where dredge spoils liquids may be returned to the estuary.

9.1 Fill Data Gaps

Gaps in data exist at the base of the reactor building on the eastern side directly downwind of the isolation condenser vent. (discussed in Section 3.4)
Based on the fact that the top 2 of 3 area aquifers flow directly (or potentially flow) into the intake and discharge canals within the area horseshoe (receive groundwater from the Cape May and Cohansey aquifers), it is recommended to:

Add at least one or two surface water sampling locations in both canals. Since the groundwater flow is outward from localized hydraulic high points in both aquifers within the horseshoe west of Route 9, the present sample location in the intake canal at Route 9 would not pick up any potential activity.

A sampling point **closer to the intake structure** to the north and west, near the bend in the canal, would pick up the northerly groundwater flow found in both aquifers.

An additional sampling point near the bend to the **south of the discharge structure** would monitor potential activity entering the canal through determined groundwater flow to the south (and into the discharge canal) prior to dilution at the Route 9 bridge, the site of the present sample point in the discharge canal.

Comments from the NJGS- see attached

State of New Jersey
DEPARTMENT OF ENVIRONMENTAL PROTECTION

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LISA P. JACKSON
Commissioner

MEMORANDUM

To: Karen Tuccillo, Research Scientist I

From: Richard Dalton, Bureau Chief

C: Karl Muessig, State Geologist
P. Schwartz, Nuclear Engineer

RE: Review of Oyster Creek Report by CRA

Date: March 7, 2007

The geology and ground water sections of the Conestoga-Rovers & Associates (CRA) report for Oyster Creek have been reviewed. Even though the report is very comprehensive, there are parts that are somewhat lacking. Although CRA may have additional data that would address the concerns identified below, it was not included or discussed in the report. Several other sections of the report were reviewed, most as related to geology and ground water.

The basic geology discussions, Section 2.4.2, **Geology**, pages 5 to 7, are fairly good except as noted. The report should reference the most up to date information on the geology and ground water. For example, the Surficial Geologic Map of Central and Southern New Jersey, 2000, subdivides the Cape May Formation into five facies and a series of weathered alluvial-colluvial deposits. This map was based on regional scale mapping done in the 1980's to the early 1990's. The Surficial Geology (1 to 100,000-scale) and Topographic Base Map (1 to 100,000-scale) of New Jersey, 2006, CD 06-1 changes some of the unit interpretations of the 2000 map and is based on additional more detailed regional mapping since 1992.

Many of the citations to Vowinkel & Foster (1981) and several to Anderson & Appel (1969) are incorrect since neither of those reports discussed the items cited.

The "Upper Clay" in the CRA report is part of the Cape May Formation, not a separate formation, and is near the base of the Cape May at this site. Their description of the "Upper Clay" implies the clay is a single 5 to 10 foot thick bed of clay with lenses or inclusions of sand in the clay. The report indicates the clay is continuous throughout the site except where it has been thinned or removed by excavation. They cite Anderson & Appel (1969) to imply it is a regional clay and thins to the west. The only mention of clay in the Cape May Formation in Anderson & Appel is on page 51, where it is stated "In the marine phase of the Cape May, a thin shallow black-clay bed occurs commonly in tidal inlet areas such as at Toms River." The extent of the "Upper Clay" has been a point of contention since before the plant was built. The original consultants for the plant assumed the clays are the continuous units with the sand layers as lenses in the clay, where as the New Jersey Geological Survey felt the sand layers are the continuous units and the clays would be the lenses. In 1967 staff from the NJGS measured several sections in the excavation for the canal (Memo, George Banino to Kemble Widmer, May 24, 1967). Based on observations made during the field visit, the "lower clay" is not a single bed, but rather a zone of clay and sand beds. Individual clay and sand layers could be traced the entire face of one part of the excavation, a distance of over 250 feet. Each layer thickened and thinned at the expense of those above or below. The clay seemed to be absent in a part of the canal, north of the reactor building. North of the measured sections was an area with a red sand layer, at about the same elevation as the clay zone. The New Jersey Geological Survey (NJGS) was not able to trace individual beds from the measured sections to determine the relationships between the sand and the clay since that part of the canal was flooded and there was a temporary road across it between the area of the measured sections and the red sand zone. A 1980 report by Environmental Affairs Department, Jersey Central Power & Light Company, indicates on page 2, based on borings, that the clay zones between -1 and 10 feet elevation are thin, not extensive and in places absent. The report also discusses the lower clay, between the Cohansey and Kirkwood which seems to be locally continuous in the area of the plant site.

The "Lower Clay" described an page 7 of the CRA report, is placed in the base of the Cohansey and has a thickness of 10 to 20 feet for the clay. Vowinkel & Foster (1981) is referenced. The Vowinkle & Foster report is also referenced for the Cohansey description and the fact that the "Lower Clay" is at the base of the Cohansey. None of this information can be found in Vowinkel & Foster. Therefore it is not clear as to the source. The Phase II Report, Ground Water Monitoring System, Woodward-Clyde Consultants, 1984, figure 1, places the lower clay in the top of the Kirkwood Formation and gives a thickness of about 10 feet. Without seeing samples of the clay it is difficult to determine if the clay is in the Cohansey or the Kirkwood, but based on the descriptions of the materials from W-17, it could very well in be the top of the Kirkwood as Woodward-Clyde Consultants indicated.

The hydrogeology discussions, Section 2.4.3, pages 8 to 10, generally are good except as noted below. On page 8 CRA indicates the Kirkwood Formation locally is artesian and on a regional basis is considered unconfined and connected with the Cohansey. The Cohansey and the upper part of the Kirkwood are regionally considered an unconfined aquifer. The lower part of the Kirkwood is the major confined aquifer from southern

Ocean to Cape May County. On page 9, mean ground water flow velocities for the Cape May and the Cohansey are given as 511 and 328 feet per year respectively (WCC, 1984). Both of these averages are based hydraulic conductivity tests conducted in 7 wells completed in each aquifer. The averages were 1.4 and 0.9 ft/day (WCC 1984). In each group of tests there was one well that had hydraulic conductivities one to two orders of magnitude lower than the rest. Both extremely low hydraulic conductivities occur in the same well cluster, well 9, Cape May and well 10, Cohansey. The fact that the two wells with low hydraulic conductivities are next to each other would cause one to question the test or the construction of those wells. Based on the boring logs for these two wells, they should have hydraulic conductivities similar to the other 6 in each formation. The velocities for the Cape May ranged from 0.69 to 2.07 ft/day excluding the low one of 0.023 ft/day. The Cohansey velocities ranged from 0.48 to 1.56 ft/day excluding the low one of 0.11 ft/day. The report, on page 9, continues with the theme that the only areas where the "Upper Clay" is absent is where it was excavated during construction. As noted above, some of the previous reports for the plant as well as visual observations indicate the clay was absent naturally in some areas. Granted, the excavations do provide direct connections between the Cape May and the Cohansey, but they are not the only interconnections between these two water bearing zones in the area of the plant. The ground water flow velocities for the Cape May and the Cohansey are reasonable and will be discussed later.

Section 3.2, **Historic Releases**, indicates "Any historic releases identified during the course of this assessment that may have a current impact on Station conditions are further discussed in Section 3.4." The key word is "current" because when Section 3.4 is examined there are no discussions of any historic releases or are any locations of the releases identified.

Section 3.3.2.2, **Radiological Investigation,** indicates that there has been no impact of the off-site environment from any on-site soil or ground water radionuclide contamination. They indicate tritium concentrations in ground water ranged from less than 130 pCi/L to 840 pCi/L. This range seems to be based on monitoring data obtained from the wells installed by Woodward-Clyde Consultants in late 1983, which were monitored through 2001. Based on the monitoring data, all the tritium above the detection limits up to the 840 pCi/L are from the Cape May monitoring wells. What CRA fails to mention is Well 14, in the Cohansey, which had concentrations of tritium ranging from 1400 to 2100 pCi/L in late 1989 through 1990. When the monitoring data is examined and plotted on maps of the ground water contours for the Cape May and the Cohansey aquifers (figures 5.1 and 5.3), there seems to be at least two or possibly three releases of tritium into the water table (Cape May Formation) and one into the Cohansey below the "Upper Clay." The releases in the water table seem to have occurred in 1998- 1999 and the one in the Cohansey in 1989 or slightly earlier. If you used the ground water flow rates determined by WCC (1984), these should have flushed out into the canal in 1 to 2 years, which is what they seem to do. Without knowing the location, the amount, and concentration of any release, it is difficult to determine if the original wells properly depicted the worst portions of the plumes of tritium in the ground water. A report, Relation of Ground Water Flowpaths and Travel Time to the Distribution of Radium and

Nitrate in Current and Former Agricultural Areas of the Kirkwood-Cohansey Aquifer System, New Jersey Coastal Plain, (Rice and Szabo, 1997; U. S. Water-Resources Investigations Report 96-4165B) discusses tritium concentrations in the Kirkwood-Cohansey. Out of 15 wells sampled only two exceeded 56 pCi/L. These concentrations were 130 and 160 pCi/L in the wells at a medium depth in the aquifer system (around 50 feet below the water table). The remainder of the medium depth well concentrations ranged from 50 to 56 pCi/L. The shallow well concentrations ranged from 37 to 55 pCi/L and the deep well concentrations ranged from <1 to 3 pCi/L. Based on these numbers it would seem that levels of tritium above the detection limits used by the plant are anomalous, especially those that are several times greater.

Section 4.3, **Groundwater and Surface Water Sample Collection**, explains the sampling procedure for the wells and how CRA determined if they were sampling the formation water. CRA used a series of field parameters and the results of the field testing are given in table 4.4. Examination of the table indicates that wells W-2A and W-4A have anomalous ph readings of 10 to11. The high ph indicates the wells may have been improperly constructed and contaminated by the cement grout. The dissolved oxygen (DO) measurements of some of the wells seem high, especially wells W-2A (11+) and W-13 (7+) both of which are in areas where CRA indicates over 10 feet of "Upper Clay" separating the water table aquifer from the Cohansey aquifer. The high DOs would tend to imply a more direct connection between the recharge from rain water or aerated water to the Cohansey aquifer.

Section 5.1, **Station Hydrogeology**, on page 29, CRA indicates "These formations are separated by the 10- to 15-foot thick "Upper Clay", which was breached during construction connecting the two permeable formations." Earlier on page 6 CRA indicates the "Upper Clay" is 5 to 10 feet thick not 10 to 15 feet. Based on field examination of the canal excavation and boring logs the "Upper Clay" is a series of thin to thick layers of clay within a zone that is generally not more than 10 feet thick. Many of the conclusions presented in the report are based on ground water contour maps for the various aquifers (figs. 5.1 through 5.4) which represent only a single snapshot in time, April 24, 2006. Although there may be a large amount of ground water data, both on water levels and water quality, CRA presents very little information on any trends. According to Woodward-Clyde Consultants (1984) they measured water levels for 16 wells on two different dates, several months apart. All but two of those wells were used and measured in the CRA investigation on April 24, 2006.

Comparing the1984 data to the 2006 water levels for the same wells there are differences in individual water levels ranging from about one tenth of a foot to 1.11 feet. Some wells had higher water elevations in 1983- 84 and in some the water levels were higher in 2006. Since the differences varied between wells and dates, the local flow directions could change significantly depending on the time of the year. The major feature on figure 5.1, a ground water low around the reactor building, would still be there, but the flow paths toward the low would change. Additional comments concerning the "Upper Clay" were given in the discussion of the Geology section.

Section 5.1.1, **Groundwater Flow Directions**, Cape May Formation, discusses figure 5.1 which is a representation of the shallowest ground water or the water table. CRA indicates that the flow is toward the intake and discharge canals with an anomalous ground water low around the reactor building. A major problem with figure 5.1 is that there are no elevations for the water in the wetlands inside the horseshoe. Wetlands generally are the surface expression of the water table in an unconfined aquifer. Figure 5.1 has the water table contours cutting across the wetlands, not following the shape of the wetlands as they would normally do. Obtaining elevations of the water in the wetlands would alter the water table contours in the wetland areas since in one case there is 3 foot difference in elevation of the water table across the wetland and in another over 8 feet. Several well points or staff gages should be set in the wetlands to measure water levels. They should be surveyed and measured at the same time as the observation wells. This would then allow for a better determination of the Cape May water table. There also should be surveyed measuring points set near the intake and discharge structures in order to get the elevation of the water in the canals at those locations. The combined ground water elevations for both the Cape May and Cohansey will present a more complete picture of the ground water movement at the site.

Figures 5.2 and 5.3 depict the potentiometric surface of the ground water in the Cohansey aquifer. Comparing these to figure 5.1 indicates several areas where the water levels in the Cohansey are similar to those in the Cape May which could imply an interconnection between the two water bearing zones. One of the more puzzling areas is near wells W-4A and W- 4B, an area where there was not any deep excavations. Logs and construction details for all the wells which CRA is using should be included in the appendix of the report. The other area where the water levels are similar is around the reactor building where the "Upper Clay" was excavated.

Even though there may not be any significant changes in overall ground water flow directions as shown on figures 5.1 through 5.4, CRA should measure water levels in all the wells during a wet and dry season, several months apart. This then would aide in determining if the current observation well network is sufficient and will properly monitor any leakage of radioactive materials into the ground water.

Section 5.1.2, **Man-made Influences on Groundwater Flow**, contains contradictory statements on page 31. The first is "Existing data do not indicate that the groundwater elevations in the Cape May Formation are influenced by the Station's withdrawal from the Intake Canal or discharge of water to the Discharge Canal." In contrast, the next sentence indicates any release to either the Cape May or Cohansey would migrate to the canals and would "…effectively minimize the potential for off-Site migration of groundwater." Based on the limited ground water level data, this statement is true. Any releases to the ground water would flow rapidly down gradient to the canals, discharge to the surface water, and become a surface water problem. Examination of figures 5.1 and 5.3 indicates that the canals do influence the ground water elevations, even though CRA has no surveyed measuring points at the intake or discharge structures and has no wells adjacent to the canals. The figures depict below sea level contours for both the Cape May and Cohansey along the Intake Canal and above sea level contours along the Discharge Canal.

Section 5.2.3, **Summary of Field Measurements,** indicates the only anomalous field measurement was the high ph in W-4A. CRA indicates there are no identified releases or physical conditions at the station to account for the anomalous ph. As discussed above under Section 4.3 the high ph likely is due to grout contamination of the well. They failed to note well W-2A also has a similar ph. The high dissolved oxygen (DO) in three of the Cohansey wells was not noted, even though it is anomalous since it indicates aerated water below the "upper clay."

Section 6.3.2, **Distribution in Station Groundwater,** indicates only one duplicate sample exceeded the LLD of 200 pCi/L that Exelon specified. If it was not that well MW-15K-1A had a duplicate sample taken, CRA would have been able to say there is no tritium in the ground water, at the station, that exceeds the detection limits.

Section 7.3.2, **Potential Groundwater Migration to Drinking Water Users Off the Station Property**, indicates that there is an incomplete pathway for tritium to affect off-site wells in the Kirkwood and the Cohansey aquifers. For the Kirkwood in Section 6.3.4, CRA indicates, on page 40, that the heads in the Kirkwood are above the existing ground surface and the "Lower Clay" minimizes the potential for downward migration. With regard to the Cohansey, in this section they indicate that Cohansey discharges to the Intake and Discharge Canals and since there is no tritium in the ground water there no current risk associated with ground water ingestion. But, there are approved ground water diversions on and adjacent to the site which if pumped at the approved rates would change the gradients in the Kirkwood, Cohansey and the Cape May water bearing zones. Also according to figure 5.2 there is a possibility for tritium, if it gets below the "Upper Clay," to flow down gradient to the east, where there are private/public wells as shown on figure 4.1. Since there is real possibility for the tritium to get below the clay as indicated by monitoring data from well W-14 in 1989- 1990, this should be concern. In times of drought the flow directions would change somewhat depending on local pumping centers.

Section 7.3.3, **Potential Groundwater to Surface Water Pathway**, CRA indicates correctly the main pathway would be the discharge of contaminated ground water to the Intake and Discharge Canals. Much of the shallow ground water from within the horseshoe will flow to the canals. Based on the ground water flow velocities given in the report, almost any spill of tritiated ground water in the central plant area would reach one of the canals in generally less than a year and within a maximum of two years. Also as indicated above there is a gradient in the Cohansey which flows to the east toward the bay, although the ground water flow along this route could take several years or more.

Section 7.4, **Summary of Potential Tritium Exposure Pathways**, indicates that two of the potential pathways are incomplete. These are the migration to the station's potable supply well and the off site migration to private and public drinking water wells. The first pathway of these is unlikely unless the plant began pumping at the capacity of the pumps in the wells, but the second pathway could occur as the area becomes more developed and there is more ground water pumpage. Large capacity Cohansey wells can reach out and draw water a thousand or more feet from the well especially during droughts. At the bottom of page 47, CRA states, "Based upon the ground and surface water data provided and referenced in this investigation, none of the potential receptors are at a risk of exposure to concentrations of tritium in excess of USEPA drinking water standards (20,000 pCi/L)." This statement can be very misleading without knowing what the potential concentrations of tritium that could be released form any of the identified sources.

The ground water to surface water pathway is complete and does occur. Data obtained from 1989 to 2001 from the 15 monitoring wells indicates there were several incidents of tritium contamination of ground water in the Cape May and at least one in the Cohansey Formation. With the highest measured level being over 2,000 pCi/L in the Cohansey that means the levels of tritium somewhere in the Cape May had to be in excess of the 2,000 pCi/L. Also without knowing the dates, amounts and concentration of the tritated releases that caused the anomalous readings in the monitoring wells, it is difficult to accurately evaluate the original ground water monitoring system. The tritium in well W-14 could have been the edge of a plume of ground water containing over the 20,000 pCi/L and it would have not been measured by any other Cohansey monitoring well, based on figure 5.3. There now are additional monitoring wells and yet there are some questionable areas.

Recommendations

1. Were there any releases of tritiated water or steam between 1987 and 2000 which could account for the levels found in the original monitoring network? If so, how much and at what concentration?
2. Set water level measuring points in the wetlands, set measuring points near the intake and discharge structures, and install two clusters of Cape May and Cohansey monitoring wells adjacent to the canals a hundred or so feet from the intake and discharge structures. All measuring points and wells should then be surveyed. Then water levels should be obtained from all the measuring points and wells during a wet and a dry period about two to three months apart.
3. Once the data has been obtained and plotted, then an overall assessment of the monitoring network can be made.

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