Test wells DO Df 12, 13, and 14 were drilled between July 21 and 29, 2010 to depths of 400, 280, and 180 feet (ft), respectively. Drill cuttings were collected at 10-ft intervals, three split-spoon samples were collected, and gross lithologic descriptions were made. Geophysical logs (gamma radiation, 16- and 64-inch resistivity, single-point resistivity, self-potential, and 6-ft lateral) were run in the open hole by the USGS Maryland Water Science Center. The holes were drilled to 9 5/8-inch diameter and well screens (4.5-inch diameter SDR-17 PVC; 0.02-inch slot) were installed from 290 to 330 ft in DO Df 12, 242 to 272 ft in DO Df 13, and 134 to 174 ft in DO Df 14. All wells include 5-ft cellars. The wells were cased to the surface with 4.5-inch SDR-17 PVC pipe. The wells were completed with steel protective casings and locking caps.

The deepest test well penetrated (from top to bottom) the Surficial aquifer, the St. Mary’s confining unit, the Choptank aquifer, the Lower Chesapeake confining unit, the Calvert aquifer system, and part of the Calvert confining unit. DO Df 14 was screened in the Choptank aquifer, which at the test site consists of fine, silty sand with abundant weathered shell material. The uppermost sand of the Calvert aquifer system was not screened, as it was too fine-grained to be productive. DO Df 13 was screened in the middle
sand of the Calvert aquifer system, which consisted of very fine, silty sand. DO Df 12 was screened in the lowermost sand of the Calvert aquifer system, which consisted of fine-grained marine sand with shell fragments.

The completed wells were developed using compressed air to remove drilling mud from the screen and gravel pack. DO Df 13 could not produce enough water to be properly developed and tested. Twenty-four hour aquifer tests were conducted on DO Df 12 and 14 at constant rates of 101 gallons per minute (gpm) and 8.6 gpm, respectively. Water levels responded in the shallower sand in the Calvert aquifer system when the deeper sand was pumped. No pumping effects were observed between the Calvert aquifer system and Choptank aquifer. Transmissivities calculated by the Cooper-Jacob method for the recovery phase of the tests were 514 ft²/day for DO Df 12 and 28 ft²/day for DO Df 14. During monitoring, water levels changed in response to atmospheric pressure.

Water samples from DO Df 12 and DO Df 14 collected during the aquifer tests were analyzed for field parameters (pH, alkalinity, specific conductance, dissolved oxygen), major ions, nutrients, metals, and radionuclides. Both wells contained elevated amounts of sodium (242-252 mg/L) and total dissolved solids (735-763 mg/L). None of the USEPA’s Primary Drinking Water Standards were exceeded.

<table>
<thead>
<tr>
<th>Well number</th>
<th>Permit number</th>
<th>Screened interval (feet below land surface)</th>
<th>Aquifer</th>
<th>Pump rate (gallons per minute)</th>
<th>Transmissivity (feet squared per day)</th>
<th>pH</th>
<th>Total dissolved solids (milligrams per liter)</th>
</tr>
</thead>
<tbody>
<tr>
<td>DO Df 12</td>
<td>DO-95-1027</td>
<td>290 - 330</td>
<td>Calvert</td>
<td>101</td>
<td>514</td>
<td>8.0</td>
<td>735</td>
</tr>
<tr>
<td>DO Df 13</td>
<td>DO-95-1028</td>
<td>242 - 272</td>
<td>Calvert</td>
<td>No pumping test conducted</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DO Df 14</td>
<td>DO-95-1029</td>
<td>134 - 174</td>
<td>Choptank</td>
<td>8.6</td>
<td>28</td>
<td>7.8</td>
<td>763</td>
</tr>
</tbody>
</table>

For more information, contact Andrew W. Staley, Maryland Geological Survey, astaley@dnr.state.md.us

DNR Publication Number: 12-9192011-527, December, 2011

Other Contact Information: DNR: Toll free in Maryland: 1-877-620-DNR; Maryland Geological Survey: 410-554-5500; TTY users call via the MD Relay


The facilities and services of the Maryland Department of Natural Resources are available to all without regard to race, color, religion, sex, sexual orientation, age, national origin or physical or mental disability.

This document is available in alternative format upon request from a qualified individual with disability.

Printed on recycled paper