

DOCKET NO. D-2002-048 CP-3

DELAWARE RIVER BASIN COMMISSION

Special Protection Waters

**Lower Makefield Township – Makefield Highlands Golf Club
Groundwater Withdrawal
Lower Makefield Township, Bucks County, Pennsylvania**

PROCEEDINGS

This docket is issued in response to an Application submitted by DelVal Soil & Environmental Consultants, Inc. (DelVal) on behalf of Lower Makefield Township (LMT) to the Delaware River Basin Commission (DRBC or Commission) on March 26, 2015 (Application), for a renewal and approval of an existing allocation of groundwater and review of a groundwater withdrawal project. This docket was previously approved by the Commission on July 20, 2005.

The Application was reviewed for continuation in the Comprehensive Plan and for approval under Section 3.8 of the *Delaware River Basin Compact*. The Bucks County Planning Commission has been notified of pending action on this docket. A public hearing on this project was held by the DRBC on February 10, 2016.

A. DESCRIPTION

1. Purpose. The purpose of this docket is to renew the approval of an existing supply of groundwater for irrigation of the docket holder's Makefield Highlands Golf Club (MHGC) golf course from existing Wells Nos. PW-1, PW-2 and PW-3. The renewal will also approve the increase in allocation of Well No. PW-1 from 2.678 mgm to 5.357 mgm. The total allocation of groundwater will remain 7.68 million gallons per month (mgm). LMT is not requesting an increase in groundwater withdrawal allocation from that contained in its prior approval.

2. Location. The project wells are located in the Delaware River Watershed, within the drainage area to the Lower Delaware Special Protection Waters, in Lower Makefield Township, Bucks County, Pennsylvania. The Delaware River near the project site is designated by the Pennsylvania Department of Environmental Protection (PADEP) as Warm Water Fishes (WWF) and Migratory Fishes (MF). The project wells are completed in the Stockton and Lockatong Formations.

Specific location information has been withheld for security reasons.

3. Area Served. The project withdrawals are only used to supply water to the docket holder's golf course irrigation system.

4. **Physical features.**

a. **Design criteria.** The project golf course is an 18-hole golf course located on 180 acres, and consists of 40 acres of fairways and tees and 3.2 acres of greens. The potable water at the golf course's clubhouse is provided Pennsylvania American Water Company (PAWC). The PAWC interconnection is also used to supplement irrigation when needed.

The irrigation system is sourced from an on-site, off-stream, man-made irrigation pond, which collects stormwater runoff from much of the course. The project wells are pumped into the irrigation pond. The docket holder has a computerized irrigation and control system, which includes fertilizer application through the irrigation system and automatic soil moisture and weather monitoring to manage the application of water.

The average and maximum demand is 0.110 million gallons per day (mgd) and 0.248 mgd, respectively. The docket holder does not expect an increase in the average or maximum daily demand over the next 10 years. The allocation of 7.68 mgm should be sufficient to meet the future demands of the MHGC system.

b. **Facilities.** The existing project wells have the following characteristics:

WELL NO.	DEPTH (FEET)	CASED DEPTH/ CASING DIAMETER	PUMP CAPACITY (GPM)	YEAR DRILLED
PW-1	460	56' / 9"	160	2002
PW-2	700	64' / 10"	70	2002
PW-3	700	60' / 10"	40	2005

All wells and water service connections are metered.

The project wellheads are located above the 100-year flood elevation.

The irrigation system is currently interconnected with the PAWC public water supply distribution system. The interconnection has a capacity of 0.288 million gallons per day (mgd) and is used on an emergency basis.

The MHGC storage facilities total 8.4 mg, which is approximately 34 days of supply.

c. **Other.** Wastewater is conveyed to the Lower Makefield Sewer Department sewage treatment facility. The capacity of this proposed treatment plant is below the Commission's review threshold. The PADEP issued its most recent WQM Permit No.

WQG02091321 on February 21, 2014 for this treatment facility. The treatment facility has adequate capacity to receive wastewater from this project.

d. **Relationship to the Comprehensive Plan.** MHGC Wells Nos. PW-1 and PW-2 were included in the Comprehensive Plan via DRBC Docket No. D-2002-048 CP issued on January 29, 2003. MHGC Well No. PW-3 was included in the Comprehensive Plan via DRBC Docket No. D-2002-048 CP-2 issued on July 20, 2005. Issuance of this docket will continue the groundwater withdrawal project in the Comprehensive Plan.

B. **FINDINGS**

Special Protection Waters

In 1992, the DRBC adopted Special Protection Waters requirements, as part of the DRBC *Water Quality Regulations (WQR)*, designed to protect existing high water quality in applicable areas of the Delaware River Basin. One hundred twenty miles of the Delaware River from Hancock, New York downstream to the Delaware Water Gap were classified by the DRBC as SPW. This stretch includes the sections of the river federally designated as "Wild and Scenic" in 1978 -- the Upper Delaware Scenic and Recreational River and the Delaware Water Gap National Recreation Area -- as well as an eight-mile reach between Milrift and Milford, Pennsylvania which is not federally designated. The SPW regulations apply to this 120-mile stretch of the river and its drainage area.

On July 16, 2008, the DRBC approved amendments to its *Water Quality Regulations* that provide increased protection for waters that the Commission classifies as Special Protection Waters. The portion of the Delaware River and its tributaries within the boundary of the Lower Delaware River Management Plan Area was approved for Special Protection Waters designation and clarity on definitions and terms were updated for the entire program.

Article 3.10.3A.2.e.1). and 2). of the *Water Quality Regulations, Administrative Manual - Part III*, states that projects subject to review under Section 3.8 of the *Compact* that are located in the drainage area of Special Protection Waters must submit for approval a Non-Point Source Pollution Control Plan that controls the new or increased non-point source loads generated within the portion of the docket holder's service area which is also located within the drainage area of Special Protection Waters. The wells providing water supply to the MHGC are located within in the drainage area to the Special Protection Waters. Since this project does not entail additional construction and expansion of facilities or service areas and there are not any new or increased non-point source loads associated with this approval, the non-point source pollution control plan requirement is not applicable at this time. Accordingly, Special Condition II.v. has been included in the Decision section of this docket.

Well No. PW-1 Hydrogeologic Evaluation

On October 29 through November 12, 2015, a fourteen day continuous-rate pumping test was conducted to assess withdrawal capabilities of Well No. PW-1. The constant rate pumping test was also conducted for the purpose of increasing the monthly allocation of PW-1 and insure no potential impacts to the local hydrologic system will occur from the increased allocation. The average pumping rate of the test on Well No. PW-1 was approximately 125.6 gallons per minute (gpm). Discharge from the pumping well was directed approximately 50 feet away into the on-site golf course irrigation pond.

Groundwater response monitoring was conducted in the pumping well (Well No. PW-1) and four (4) monitoring wells (monitored with continuous dataloggers). Eleven (11) additional monitoring wells included in the long-term monitoring network were monitored manually 4 times throughout the pumping test (prior to start up, four (4) days after start up, one (1) day prior to shutdown and after shutdown. Monitoring wells ranged in distance to the pumping well from approximately 275 feet (MW-1) to approximately 1,800 feet (MW-8).

Prior to the start of the pumping test, Well No. PW-1 had a static water level of 18.81 feet below top of casing (btoc). Maximum drawdown observed at the pumping well, after approximately fourteen (14) days of pumping at an average rate of 125.6 gpm, was 131.91 feet (water level of 150.72 feet btoc). Drawdown as a result of pumping was observed in three (3) monitoring wells, PW-2, PW-3 and MW-1 which had drawdowns of 10.06, 8.24 and 16.32 feet, respectively. Drawdown as a result of the withdrawals from the Well No. PW-1 were not discernable in the other monitoring wells.

The observed drawdown was used to calculate aquifer parameters to characterize the underlying aquifer. The transmissivity values for Well No. PW-1 test data was 172 ft²/day (Theis Method) and 159 ft²/day (Theis Recovery Method) at the test rate of 125.6 gpm. The transmissivity value for monitoring well PW-3 was 850 ft²/day (Theis Method). An average Storativity of 8.82×10^{-4} was calculated from the drawdown data observed at monitoring well PW-3 monitored during the pumping test. The storage coefficient is indicative of confined conditions.

The DRBC has reviewed the hydrogeological report for Well No. PW-1 pumping test. No adverse impacts are expected to occur to the local hydrologic system due to the increased pumping from Well No. PW-1.

The project is designed to conform to the requirements of the *Water Code* and *Water Quality Regulations* of the DRBC.

The docket holder estimates that the project withdrawals, used for the purpose of golf course irrigation, result in a consumptive use of 90 percent of the total water use. The DRBC definition of consumptive use is defined in Article 5.5.1.D of the *Administrative Manual – Part III – Basin Regulations – Water Supply Charges*.

The docket holder shall pay for surface water in accordance with the provisions of *Administrative Manual Part III Basin Regulations – Water Charges*.

The project does not conflict with the Comprehensive Plan and is designed to prevent substantial adverse impact on the water resources related environment, while sustaining the current and future water uses and development of the water resources of the Basin.

C. DECISION

I. Effective on the approval date for Docket No. D-2002-048 CP-3 below:

- a. The project described in Docket No. D-2002-048 CP-2 is removed from the Comprehensive Plan to the extent that it is not included in Docket No. D-2002-048 CP-3; and
- b. Docket No. D-2002-048 CP-2 is rescinded and replaced by Docket No. D-2002-048 CP-3.
- c. The project and the appurtenant facilities described in the Section entitled “Physical features” above shall be added to the Comprehensive Plan.

II. The project as described in the Section entitled “Physical features” above is approved pursuant to Section 3.8 of the *Compact* and is granted this withdrawal permit pursuant to Section 10.3 of the *Compact*, subject to the following conditions:

- a. Docket approval is subject to all conditions, requirements, and limitations imposed by the PADEP, and such conditions, requirements, and limitations are incorporated herein, unless they are less stringent than the Commission’s. Within 60 days (August 10, 2015), the docket holder shall provide written confirmation to the Commission that it has registered and will report with PADEP all surface and groundwater sources described in this docket in accordance with the Pennsylvania Regulations (Title 25 - Environmental Protection, [25 PA. CODE CH. 110], Water Resources Planning).
- b. The wells and operational records shall be available at all times for inspection by the DRBC.
- c. The wells shall be operated at all times to comply with the requirements of the *Water Code* and *Water Quality Regulations* of the DRBC.
- d. During any month, the combined withdrawal from all well sources shall not exceed 7.68 mgm or 46.08 million gallons per year (mgy) (7.68 mgm times 6 months). No well shall be pumped above the maximum instantaneous rate and monthly allocation as indicated below:

WELL NO.	MAXIMUM INSTANTANEOUS RATE (GPM)	MONTHLY ALLOCATION (MGM)
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WELL NO.	MAXIMUM INSTANTANEOUS RATE (GPM)	MONTHLY ALLOCATION (MGM)
PW-1	125	5.357
PW-2	70	3.214
PW-3	40	1.786

e. The wells shall be equipped with a readily accessible capped port and drop pipe so that water levels may be measured under all conditions.

f. The docket holder shall pay for surface water use in accordance with *Administrative Manual – Part III Basin Regulations – Water Supply Charges*.

g. The project withdrawals shall be metered with an automatic continuous recording device that measures to within 5 percent of actual flow. An exception to the 5 percent performance standard, but no greater than 10 percent, may be granted if maintenance of the 5 percent performance is not technically feasible or economically practicable. A record of daily withdrawals shall be maintained, and monthly totals shall be reported to the PADEP annually and shall be available at any time to the Commission if requested by the Executive Director.

h. Each new water service connection shall include a water meter in accordance with the DRBC's Resolution No. 87-7 (Revised).

i. The docket holder shall implement to the satisfaction of the PADEP, the continuous program to encourage water conservation in all types of use within the facilities served by this docket approval. The docket holder will report to the PADEP on the actions taken pursuant to this program and the impact of those actions as requested by the PADEP.

j. A long-term monitoring program is required to obtain data on ground water and surface water hydrologic conditions in the project area. The docket holder shall continue to implement the long-term monitoring program as submitted by the docket holder in a report dated November 1, 2002. This program will include the following:

1. **Ground Water Level Monitoring** – MHGC shall monitor thirteen (13) wells identified in the above referenced letter to estimate annual ground water fluctuations caused by seasonal changes and/or production well pumping, and detect water level declines that may affect the performance of public and private wells in the area of the MHGC wells.

2. If the water level in MW-1 or MW-8 declines to 75 feet or 50 feet below top of casing (btoc), respectively, water level measurements should be conducted weekly in the monitoring network wells. If the water level in MW-1 or MW-8 declines to 80 feet or 55 feet below top of casing (btoc), respectively, the pumping rate in PW-1 should be reduced by 25% (94 gpm).

3. **Reports** - All monitoring data, including records required in Conditions “g.” and “j.” herein shall be submitted to the Commission annually, due by April 1. The docket holder is encouraged to submit the annual report electronically. The report shall be prepared by a hydrogeologist and shall assess the effects of well withdrawals on hydrologic conditions in the area. This report shall include an evaluation of the monitoring data required by this docket approval and such information as deemed appropriate by the hydrogeologist or required by the Executive Director.

4. The Executive Director may modify the monitoring program or temporarily suspend or modify this docket at any time if review of the hydrologic data and/or any other information indicates such action is necessary or appropriate.

k. No water service connections shall be made to newly constructed premises with plumbing fixtures and fittings that do not comply with water conservation performance standards contained in Resolution No. 88-2 (Revision 2).

l. The docket holder shall implement its Water Conservation Plan as approved by PADEP, and shall report to the PADEP on actions taken pursuant to this program and the impact of those actions as requested by the PADEP.

m. The docket holder shall implement to the satisfaction of the PADEP, a drought or other water supply emergency plan.

n. No new water service connections shall be made to premises connected to sewerage systems which are not in compliance with all applicable effluent limits contained in State permits and the *Water Quality Regulations* of the Commission.

o. Nothing herein shall be construed to exempt the docket holder from obtaining all necessary permits and/or approvals from other State, Federal or local government agencies having jurisdiction over this project.

p. The docket holder is permitted to provide the water approved in this docket to the areas included in Section A.3. Area Served of this docket. Any expansion beyond those included in Section A.3. Area Served is subject to DRBC review and approval in accordance with Section 3.8 of the *Compact*.

q. Unless an extension is requested and approved by the Commission in advance, in accordance with paragraph 11 of the Commission's Project Review Fee schedule (Resolution No. 2009-2), the docket holder is responsible for timely submittal of a docket renewal application on the appropriate DRBC application form at least 12 months in advance of the docket expiration date set forth below. The docket holder will be subject to late charges in the event of untimely submittal of its renewal application, whether or not DRBC issues a reminder notice in advance of the deadline or the docket holder receives such notice. In the event that a timely and complete application for renewal has been submitted and the DRBC is unable, through no fault of the docket holder, to reissue the docket before the expiration date below (or the later date established by an extension that has been timely requested and approved), the terms and conditions of the current docket will remain fully effective and enforceable against the docket holder pending the grant or denial of the application for docket approval.

r. The issuance of this docket approval shall not create any private or proprietary rights in the water of the Basin, and the Commission reserves the rights to amend, alter or rescind any actions taken hereunder in order to insure the proper control, use and management of the water resources of the Basin.

s. If the monitoring required herein or any other relevant data or information demonstrates that the operation of this project is interfering with or otherwise impairing existing uses of ground or surface water, or if the permit holder receives a complaint from an existing ground or surface water user within the zone of influence of the withdrawal alleging such interference or impairment, the permit holder shall immediately notify the Executive Director, and unless excused by the Executive Director, shall investigate the demonstrated or alleged impacts. For purposes of this condition, notification shall mean either (a) electronic transmittal of written notice to the Executive Director via email (using addresses posted on the DRBC website); or (b) written notice to the Executive Director and a telephone call to the Project Review Section at 609-883-9500, ext. 216. (Oral notification must always be accompanied by immediate written notification directed to the Executive Director.) In addition, the permit holder shall provide written notice to all potentially affected water users of the permit holder's responsibilities under this condition. **Any well or surface water supply that is impaired as a result of the permit holder's project withdrawal shall be repaired, replaced or mitigated at the permit holder's expense.** The scope of the options to consider for repair, replacement and/or mitigation shall not be limited solely to those that are owned, operated, or controlled by the project sponsor. An investigation report and/or mitigation plan prepared and certified by a licensed professional engineer and/or a licensed professional geologist shall be submitted to the Executive Director as soon as practicable following notice of the demonstrated or alleged impairment consistent with this paragraph. The Executive Director shall make the final determination regarding the scope and sufficiency of the investigation and the extent of any mitigation measures that may be required. Where ground and surface waters are rendered unavailable, unusable, or unsuitable for the pre-existing use, the Executive Director may direct the permit holder to take interim actions to mitigate such impacts, pending completion of the investigative report and any long-term repair, replacement or mitigation.

t. The Executive Director may modify or suspend this approval or any condition thereof, or require mitigating measures pending additional review, if in the Executive Director's judgment such modification or suspension is required to protect the water resources of the Basin.

u. For the duration of any drought emergency declared by either Pennsylvania or the Commission, water service or use by the docket holder pursuant to this approval shall be subject to the prohibition of those nonessential uses specified by the Governor of Pennsylvania, the Pennsylvania Emergency Management Council, PADEP, or the Commonwealth Drought Coordinator to the extent that they may be applicable, and to any other emergency resolutions or orders adopted hereafter by the Commission.

v. Prior to allowing connections from any new service areas or any new developments, the docket holder shall either submit and have approved by the Executive Director of the DRBC a Non-Point Source Pollution Control Plan (NPSPCP) in accordance with Section 3.10.3.A.2.e, or receive written confirmation from the Executive Director of the DRBC that the new service area is in compliance with a DRBC approved NPSPCP.

w. Any person who objects to a docket decision by the Commission may request a hearing in accordance with Article 6 of the *Rules of Practice and Procedure*. In accordance with Section 15.1(p) of the *Delaware River Basin Compact*, cases and controversies arising under the *Compact* are reviewable in the United States district courts.

BY THE COMMISSION

APPROVAL DATE: March 16, 2016

EXPIRATION DATE: December 9, 2025