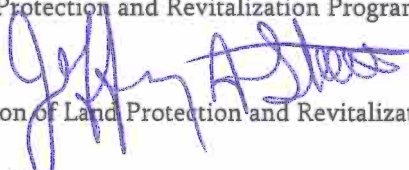


COMMONWEALTH OF VIRGINIA  
Department of Environmental Quality

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**Subject:** Division of Land Protection and Revitalization Guidance Memo  
LPR-GWSI- 2011-10  
SUBMISSION INSTRUCTIONS FOR GROUNDWATER SEMI-ANNUAL and QUARTERLY  
MONITORING REPORTS

**To:** Regional Land Protection and Revitalization Program Managers

**From:** Jeffery A Steers   
Director, Division of Land Protection and Revitalization

**Date:** December 16, 2011

**Copies:** Regional Directors

**Summary**

This guidance provides owner/operators of regulated solid waste management facilities with an overview of the information applicable to the submission of semi-annual or quarterly groundwater reports at solid waste sites undergoing groundwater monitoring in accordance with 9 VAC 20-81-250 of the Virginia Solid Waste Management Regulations (VSWMR).

**Electronic Copy**

An electronic copy of this guidance applicable to solid waste sites is available on DEQ's website at <http://www.deq.virginia.gov/waste/guidance.html>.

**Contact Information**

Owner/operators who wish to petition for the use of a groundwater APC should contact their respective Regional Office for any site specific questions. Please contact the groundwater program coordinator, Mr. Geoff Christe at (804) 698-4283 or via email [geoff.christe@deq.virginia.gov](mailto:geoff.christe@deq.virginia.gov) with any questions regarding the development or application of this guidance.

**Disclaimer**

*This document is provided as guidance and, as such, sets forth standard operating procedures for the agency. However, it does not mandate any particular method nor does it prohibit any alternative method. If alternative proposals are made, such proposals should be reviewed and accepted or denied based on their technical adequacy and compliance with appropriate laws and regulations.*



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# Submission Instruction

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## Semi-annual and Quarterly Report Submissions

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Division of Land Protection &  
Revitalization  
629 East Main Street 5<sup>th</sup> Floor  
Richmond, VA 23219

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## I - APPLICABILITY

The Submission Instruction (SI) defined herein is applicable to all solid waste management facilities conducting groundwater monitoring under the requirements of the Virginia Solid Waste Management Regulations (VSWMR), originally promulgated by the Virginia Waste Management Board December 21st, 1988; as amended. This SI has been designed in a manner consistent with the regulatory language in Amendment 7 of the VSWMR, effective March 16<sup>th</sup> 2011. It supersedes those issued by the Department in August of 2004.

## II - DEVELOPMENT

This SI has been developed to assist in Semi-annual and Quarterly groundwater monitoring report preparation. The SI defined herein provides an outline of the suggested minimum technical content that should be included within a Semi-annual or Quarterly monitoring report.

## III - LIMITATIONS

This SI has not been developed as Department rule or policy. It has not gone through public comment. It does not supersede any regulatory requirement found in the VSWMR. Its use is not mandated under the current VSWMR. The Department recognizes that these SI may need to be altered to fit facility-specific geologic or hydrologic conditions that cannot be adequately accounted for in an SI. It is expected that the final content of any submittal to the Department will likely include one or more site-specific considerations. While use of these SI may assist the Permittee in development of a complete Semi-annual or Quarterly monitoring report, use of the SI does not imply any guarantee of final Department approval of the report contents.

All SI are considered 'living' documents which will be updated or revised as needed. Comments or suggestions for future SI revisions can be submitted at any time to the attention of the *Groundwater Program Coordinator* at the address listed on the cover of this SI.

## IV - REPORT FORMAT

9 VAC 20-81-250.E.2.b.(1) requires the Semi-annual or Quarterly monitoring report be submitted within 120 days of the completion of sampling and analysis actions conducted under 9 VAC 20-81-250.A.4.h. Any revisions to the monitoring report required to address the Department's technical review comments shall be submitted in a manner consistent with the time-frames defined in the technical review letter.

The Semi-annual or Quarterly monitoring report must be signed by a professional geologist or qualified groundwater scientist (*9 VAC 20-81-250.E.2.b.(1),(a)*). For the sake of consistency and to ensure an expeditious review, the information (technical content) of the report should be arranged in the order presented in sections below. The sections discussed herein shall be considered standard technical content. Monitoring report submissions that do not provide the standard technical content outlined herein are more likely to be found to be incomplete and requiring revision during the Department's technical review process. The Department also notes that there may be some site-specific instances where a facility's technical data may require additional or different information beyond that listed in these SI as a means of more fully characterizing the technical data available and conclusions derived thereof. These instructions set no limit on the number or content of additional report sections, as long as the information included directly pertains to that required of a groundwater monitoring report.

Attachment 1 consists of a blank, boilerplate formatted monitoring report to be filled out by the Owner/Operator. Electronic versions in 'Excel' format may be obtained from your DEQ Regional Office groundwater contact.

## V - TECHNICAL CONTENT

The reporting provisions concerning Semi-annual and Quarterly reports are found in *9 VAC 20-81-250.E.2.b.(1)*. These SI define specific types of information which should be addressed during completion of the monitoring report. The standardized information items are discussed individually below:

Line 1 DEQ Regional Office to which you submit your monitoring reports. You may abbreviate as NRO (Northern), PRO (Piedmont), VRO (Valley), TRO (Tidewater), BRRO/R (Blue Ridge - Roanoke), BRRO/L (Blue Ridge - Lynchburg) and SWRO (Southwest).

Line 2 List the date the report is issued to DEQ.

Line 3 Permit Number. Use abbreviation of UNP for sites which lack a Permit and monitor groundwater under an Order or some other compliance agreement.

Line 4 Facility name.

Line 5 Identify the landfill type, (i.e., Sanitary, CDD, or Industrial).

Line 6 Note the operational status, (i.e., active, inactive, or closed). Please note that 'closed'

should only apply to those facilities that have completely finished all closure actions and have rec'd DEQ 'sign-off' on their closure.

- Line 7 List the groundwater program under which the landfill currently samples groundwater, (i.e., Detection, Assessment, First Determination, Phase II). For sites which have separate cells/areas in different monitoring programs, use the term 'combo'. Please note that there is no 'Corrective Action Monitoring Program'. Corrective Action is a subset of Assessment or Phase II Monitoring.
- Line 8 List the status of GPS for the site (i.e., not applicable, proposed, or established).
- Line 9 Provide a simplified description of the site's location (i.e., driving directions) noting what city, town or county the site is located in.
- Line 10 Provide a simplified description of the geologic setting the landfill was constructed within. This information may be obtained from any existing geologic map covering the area – however area specific information should be used if available (in lieu of simply using information gathered from the Geologic Map of Virginia).
- Line 11 Describe which of Virginia's physiographic provinces the landfill is located in.
- Line 12 List the aquifer type, (i.e., confined, unconfined, or semi-confined).
- Line 13 Total number of compliance wells in the landfill's monitoring network as listed in the facility Permit. Those facilities which still monitor under a 'one-page' Permit should list the wells as listed in their most recent Groundwater Monitoring Plan.
- Line 14 Total upgradient compliance wells in the landfill's monitoring network as listed in the facility Permit.
- Line 15 Total downgradient compliance wells in the landfill's monitoring network as listed in the facility Permit.
- Line 16 Total wells in the landfill's monitoring network associated with any implemented groundwater corrective action as listed in the facility Permit Module XIV. There may be cases where remediation or NES wells exist on a site which has not yet implemented its corrective action program. In these cases, such wells are typically not routinely sampled and as a result should not be listed here.
- Line 17 Number of performance wells in the landfill's monitoring network associated with any implemented groundwater corrective action as listed in the facility Permit,

Module XIV.

Line 18 Number of sentinel wells in the landfill's monitoring network associated with any implemented groundwater corrective action as listed in the facility Permit, Module XIV.

Line 19 Yes or no.

Line 20 Identify the well pair(s) used to calculate site specific groundwater flow rate.

Line 21 Provide the result of the groundwater flow rate calculation.

Line 22 Provide the direction(s) of groundwater flow on site. Directions may be abbreviated using common forms such N, E, S, W, or NE, SE, SW, NW. In those cases where flow may be in two distinct directions, use both abbreviations. Landfills located near ridge tops may use the term 'radial' if applicable.

Line 23 List the date(s) groundwater was sampled.

Line 24 Yes or no.

Line 25 Yes or no. Please note that the term 'purged' as used means well evacuation actions consistent with USEPA RCRA C and D program guidance.

Line 26 Yes or no. If the answer is yes, please fill out lines 'a' through 'd' with a yes or no as appropriate and circle initial occurrence if applicable.

Line 27 Provide the date the samples were sent to the analytical lab.

Line 28 Yes or no.

Line 29 Provide the date the samples were rec'd at the lab.

Line 30 Yes or no.

Line 31 Yes or no.

Line 32 Provide the date the analytical report was issued by the lab under the signature of the lab manager/director.

Line 33 Provide the date the analytical report was rec'd by the consultant/facility.

Line 34 Identify the method used to run the statistical analysis. The method selected should be that found listed in the most current groundwater monitoring plan.

Line 35 Yes or no.

Line 36 Yes or no. Circle initial occurrence if applicable.

Line 37 Yes or no.

Line 38 Yes or no. [circle initial occurrence if applicable]. If the answer to Line 38 is yes, answer Line 38a with a yes or no answer.

Line 39 If verification sampling was undertaken, note the date, or use 'n/a' if not applicable.

Line 40 Provide the date the Department was notified of any exceedance, or use 'n/a' if not applicable.

Line 41 Yes or no, or use 'n/a' if not applicable.

Line 42 Yes or no.


Line 43 Yes or no, or use 'n/a' if not applicable. Those sites in the process of plume delineation shall use 'no' until such time as the Department has given approval to the delineation results.

#### REPORT ATTACHMENTS

- Att-I USGS topographic map showing site location. It is not appropriate to identify the site solely on a 3rd party electronic mapping database unless the software uses seamless digitized versions of USGS 7.5 minute topographic quadrangle maps.
- Att-II Provide a simple table which lists each well and its corresponding groundwater elevation as measured during the compliance event.
- Att-III Provide the calculations used to estimate groundwater flow rate.
- Att-IV Provide a potentiometric surface map, scaled to fit a page no larger than 11" x 17".

- Att-V Provide a simple table which lists each well and its corresponding list of groundwater constituents found to exceed facility background. Any constituents found to exceed for the initial time should be presented in italics.
- Att-VI Provide a simple table which lists each well and its corresponding list of groundwater constituents found to exceed GPS. Any constituents found to exceed for the initial time should be presented in italics. In those cases where a facility identifies no constituents above GPS, a table of wells should still be provided, but the table can be 'water marked' to say no GPS exceeded identified.
- Att-VII Attach a copy of the laboratory report, including the cover and signature pages, as well as the lab accreditation certification form. This information may be presented as a PDF on a CDROM if desired.
- Att-VIII Attach a copy of the 'chain of custody' documentation. This information may be presented as a PDF on a CDROM if desired.
- Att-IX Attach a copy of the field book documentation concerning elevation, purging, and sampling actions. This information may be presented as a PDF on a CDROM if desired.
- Att-X Provide copies of the computer generated statistical analysis. This information may be presented as a PDF on a CDROM if desired. In those cases where a facility uses a simple point to point statistical comparison, a table can be presented instead which shows for each well, the concentration of constituents found at quantifiable levels, and lists the site background and (if applicable) the GPS for the constituent. Constituents found to exceed either number should be presented in bold format.
- Att-XI This attachment should be used for the discussion of any 'Special Conditions', such as wells that could not be sampled, problems with the analytical data, or other site specific conditions which require some detailed description.



Semi-Annual Groundwater Monitoring Report		
	1] DEQ Region:	2] Date:
	3] Solid Waste Permit Number:	
4] Facility Name:	5] Landfill Type:	
6] Operational Status:		
7] GW Program:	8] GPS Status:	
9] Simplified Site Location Description:	10] Simplified Bedrock Type Discussion:	
11] Physiographic setting:	12] Aquifer Type:	
13] # of Compliance Wells:	14] # of Upgradient Wells:	15] # of Downgradient Wells:
16] # of Corrective Action Wells:	17] # of Performance Wells:	18] # of Sentinel Wells:
Aquifer Specifics		
19] Were groundwater elevations measured at each monitoring well?		
20] List the well pair(s) used to calculate groundwater flow rate?		
21] The calculated groundwater flow rate (given in feet per year)		
22] Direction(s) of groundwater flow on site:		
Groundwater Sampling Specifics		
23] Date GW was sampled pursuant to 9 VAC 20-80-300 B or C?		
24] Were all wells secured/locked prior to sampling?		
25] Were all wells purged prior to sampling?		
26] Were any compliance wells unable to be sampled?		
For wells not sampled during the compliance event; provide the reason below and note whether this was a first time occurrence, or whether it has been observed on site before with the particular well in question.		
26-a] External damage to the well? (Initial occurrence?)		
26-b] Internal damage to the well? (Initial occurrence?)		
26-c] Failure to yield sampling volume after purging. (Initial occurrence?)		
26-d] Well dry, could not be purged? (Initial occurrence?)		

Analytical Lab Information	
27] Date GW samples sent to analytical lab:	
28] Were samples submitted under Chain of Custody?	
29] Date GW samples rec'd at analytical lab:	
30] Were any problems noted with the samples upon rec'pt at lab?	
31] Were samples analyzed using SW-846 (as updated) methods?	
32] Date signed/certified analytical report issued by lab:	
33] Date signed/certified analytical report rec'd by consultant/facility:	
Interpretation and Response to Analytical Results	
34] Type of statistical method used to identify exceedances?	
35] Were any unusual statistical problems noted (i.e. outliers)?	
36] Do any constituents exceed the site background? (Initial occurrence?)	
37] Were results compared to GPS (including most recent ACLs)?	
38] Do any constituents exceed GPS? (Initial occurrence?)	
(if yes) 38-a] Were any of the exceedances for new constituents or wells?	
39] Was verification sampling undertaken?	
(if yes) 39-a] Date of the verification event?	
(if yes) 39-b] Date verification results released by the analytical lab?	
(if yes) 39-c] Did verification event confirm exceedances?	
40] Date DEQ was notified (if applicable) of the exceedance(s)?	
41] Will facility pursue an ASD for any of the exceedances?	
42] If BKG exceeded, has facility advanced to the next phase of groundwater monitoring?	
43] If GPS exceeded, has facility delineated release in horizontal and vertical dimensions?	
Attachments. The following attachments must be submitted in the order prescribed.	
Attachment I: Site Identified on a USGS 7 1/2-minute Topographic Map	
Attachment II: GW elevation table (as measured during the sampling event)	
Attachment III: GW flow rate calculations based on data presented in Attachment II	
Attachment IV: Potentiometric Surface Map scaled to fit a size no larger than 11" x 17"	
Attachment V: Table of constituents exceeding background, listed for each well	
Attachment VI: Table of constituents exceeding GPS, listed for each well	
Attachment VII: Complete Laboratory Analytical Report (including Verification events)	
Attachment VIII: Chain of Custody documentation (including Verification events)	
Attachment IX: Field book documentation (including Verification events)	
Attachment X: Statistical Data Sheets	
Attachment XI: Special Conditions Description	

*Note: Attachments VII, VIII, IX, and X may be submitted in electronic format on CD.*

Responsible Official Signature:

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering the information, the information submitted is to the best of my knowledge and belief true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

Name:

Title:

Signature:

Date: