

**GUDE LANDFILL REMEDIATION**

**DEP, EA ENGINEERING & MDE MEETING**

DATE: February 23, 2011  
TIME: 12:30 PM to 2:30 PM  
LOCATION: MDE Office – Baltimore, MD

ATTENDANCE:

<u>Name</u>	<u>Organization</u>	<u>Designation</u>
Binyam Woldemichael	Maryland Department of the Environment	Regulator
Kassa Kebede	Maryland Department of the Environment	Regulator
Martha Hynson	Maryland Department of the Environment	Regulator
Ed Carlson	Maryland Department of the Environment	Regulator
Andrew Grenzer	Maryland Department of the Environment	Regulator
John Kumm	EA Engineering, Science, and Technology, Inc	DEP Consultant
Barb Roeper	EA Engineering, Science, and Technology, Inc	DEP Consultant
Laura Oaks	EA Engineering, Science, and Technology, Inc	DEP Consultant
Peter Karasik	Montgomery County Dept. of Env. Protection (DEP)	Section Chief
Steve Lezinski	Montgomery County Dept. of Env. Protection (DEP)	Engineer III
Dave Lake	Montgomery County Dept. of Env. Protection (DEP)	Special Assistant/ Office of the Director

The Meeting Agenda is included as Attachment 1.

Contact information for attendees is included as Attachment 2.

MINUTES:

- 1) The purpose of the meeting was to review the Maryland Department of the Environment's (MDE) comments on the Gude Landfill – Nature and Extent Study and the Remediation Feasibility Memorandum. Representatives from the County DEP, EA Engineering (EA) and MDE attended.
- 2) MDE reviewed the Gude Landfill – Nature and Extent Study (NES) Report and is requesting additional information to more fully characterize the extent of potential impacts to groundwater. Potential impacts should be presented to the single constituent (i.e. parameter) level that exceed groundwater protection standards, as well as the factors that may be causing the impacts in the vicinity of the Landfill. MDE indicated that this information is necessary to finalize the NES, prior to assessing potential corrective measures. Some of the information requested by MDE may require additional groundwater sampling and analyses. Other information may require clarifications on and more detailed analyses of existing information previously gathered and

reported. The County agreed to submit a Draft Amendment Plan to MDE that will address MDE's comments and to reach agreement before proceeding with any additional NES work.

- 3) MDE indicated that the horizontal and vertical extent of potential impacts of the Landfill should be bounded, whether it is based on groundwater/surface water sampling data (up gradient/down gradient), computerized modeling or other defensible explanations regarding site constraints surrounding the Landfill such as hydraulic barriers or limited site access. MDE's primary areas of the Landfill site for further assessment include the: northwest, northeast, south-central and southeast.
- 4) Since maximum contaminant level (MCL) exceedances were noted at the Landfill property boundary, beyond the waste footprint and in the Derwood Station Community, additional analyses need to be conducted. These can include: installation of additional groundwater monitoring wells, additional groundwater sampling and/or fate and transport modeling to enable identification or extrapolation of detected constituents to a non-detect (ND) or to a level that approaches groundwater protection standards. These additional analyses will serve to better identify the full extent of the potential impacted areas in the vicinity of the Landfill. Seasonal variation trends in the groundwater sampling data (e.g. fluctuations in constituent concentrations) should also be considered and evaluated. MDE specifically requested an additional groundwater monitoring well down gradient of MW-9 in the Derwood Station Community.
- 5) Where surface water bodies may act as hydrogeologic divides (e.g. hydraulic barriers), the NES report should describe why this feature potentially limits the migration of constituents that exceed groundwater protection standards from the Landfill.
- 6) The graphical depiction of detected Volatile Organic Compounds (VOCs) on a Total VOC basis for the NES Report Constituents of Concern is a good starting point to assess the extent of potential impacts to groundwater from the Landfill. However, the nature and extent and graphical depictions of other constituents including metals that exceed individual groundwater protection standards should also be provided and discussed. Note that while VOCs are potentially discharged to surface water via groundwater, they are not detected in the bordering surface water bodies to the Landfill.
- 7) Regarding the nature of potential impacts to groundwater from the Landfill, MDE indicated that the NES Report should include information on the contribution to potential impacts from waste, stormwater infiltration, leachate, surface water runoff in an industrial area, and/or landfill gas.
- 8) MDE requested that the NES Report more thoroughly address the source of metals exceedances, particularly chromium in the groundwater sampling data.

- 9) MDE agreed that groundwater sample turbidity may be interfering with the metals analysis. The NES Report should identify turbidity as an issue and address it accordingly. In the short term, groundwater sample filtration or a longer waiting period for recharge after the 3-volume well purge (up to 24-hours), may produce samples that are more representative. In the long term, redevelopment may be necessary for certain groundwater monitoring wells. MDE suggested taking filtered and unfiltered samples from the groundwater monitoring wells.
- 10) Although MDE did not require leachate indicator parameters to be included in the NES groundwater sampling program, MDE requested such parameters be included on subsequent sampling and analyses. The leachate indicator parameters include: pH, alkalinity, hardness, chloride, specific conductance, nitrate, Chemical Oxygen Demand (COD), turbidity, ammonia, sulfate and total dissolved solids. It was noted that the leachate indicator parameters were included in the County's semi-annual groundwater sampling event in September 2010 as planned per the approved Groundwater and Surface Water Monitoring Plan. MDE requested that samples be collected from the original (20) and newly installed (16) groundwater monitoring wells until further notice. The County agreed to this as part of the semi-annual sampling events.
- 11) MDE recommended that the site topographic map be used as the base map for presenting both the groundwater contour data and the groundwater sampling data as well as for delineating the locations of bordering surface water bodies (i.e. Crabbs Branch Stream and Southlawn Branch Stream).
- 12) MDE requested that the NES Report text and graphics related to the groundwater contour map consider more closely the relationship of site topography and the apparent flow direction of surface water bodies along the perimeter property boundary of the Landfill. More localized (e.g. radial) groundwater flow components should be addressed in these areas of the site in an attempt to close the groundwater contours.
- 13) MDE suggested that surface water elevations from bordering streams be measured and included in the groundwater contour details. This information can be used to tie-in elevation data for the perimeter Landfill property boundary and groundwater monitoring wells (per the topographic survey) with the measured elevation of the surface water body.
- 14) MDE suggested that the NES Report address landfill surface hydrology, including the way in which topography and existing stormwater drainage structures minimize ponding and infiltration, as well as the seasonal variations.
- 15) MDE suggested that the NES Report address the potential impacts of industrial operations along Southlawn Lane on surface water and groundwater quality in the vicinity of the Landfill.

- 16) MDE suggested that the positive effects of the recent landfill gas collection system expansion on both gas migration and groundwater VOC concentrations, which is essentially an interim corrective measure, be described in the NES Report. The County may want to compare landfill gas composition data with groundwater sampling data as supporting documentation.
- 17) MDE confirmed that the excavation and relocation of waste, in areas where it is close to or outside the property boundary, would be an acceptable interim corrective measure to potentially reduce landfill gas migration and improve localized groundwater quality for the Landfill site. MDE noted that interim corrective measures are approved by the Department and could be implemented in advance of the final remediation approach. The County would need to submit a waste excavation, relocation and contingency plan to MDE for approval. The Plan would need to address: waste handling procedures, leachate seep control, stormwater run on/runoff, erosion and sediment control, final waste disposal (i.e., back in the Gude Landfill or to the Transfer Station), phasing and schedule, dust and odor control, fire protection and worker safety. MDE noted there are other facilities in Maryland that have performed similar work, including Cecil County and Worcester County. Trench excavation or borings (from previous or new landfill gas extraction wells) could potentially be used to characterize the extent of waste decay.
- 18) MDE reviewed the Remediation Feasibility Memorandum (Memorandum). MDE requested confirmation that the Memorandum was intended to be a summary of technically feasible corrective measures considered viable for further evaluation – not a formal Assessment of Corrective Measures. The County and EA confirmed this understanding. MDE indicated that the next step after completion of the NES Report would be an Assessment of Corrective Measures. MDE confirmed that the potential corrective measures outlined in the Memorandum were acceptable potential corrective measure alternatives for evaluation for the Gude Landfill, individually or in combination.
- 19) MDE suggested that runoff calculations for various capping systems, cover systems or contour changes to the surface grades of the Gude Landfill be included in the future Assessment of Corrective Measures. Such potential changes should be compared to the effectiveness of an approved low permeable capping system per the Code of Maryland Regulations (COMAR).
- 20) MDE expressed satisfaction with the County's past practices and continued plans for communicating with the GLCC and Derwood Station Community.
- 21) MDE stated that the Human Health and Ecological Risk Evaluations are not typical submissions in a NES; however, the information appears to have been pertinent to the County's relationship and on-going dialog with the GLCC and the neighboring Derwood Station Community.

22) MDE agreed to defer the discussion of possible sampling and analysis of groundwater via Bio-Monitoring test procedures (Whole Effluent Toxicity Testing and Toxicity Reduction Evaluation) to a separate meeting with MDE Science Services Administration. Bio-Monitoring is typically used to assess point source discharges into surface water bodies, not area discharges or potential discharges from groundwater to a surface water body. EA noted that an ecological risk evaluation was included as part of the NES Report, which may provide some related information for MDE review.

- a. Telephone Follow-Up: On February 24, 2011, at approximately 3:18 PM, Steve Lezinski received a call from Ed Carlson of MDE. Mr. Carlson stated that after internal MDE evaluation, the County does not have to perform Bio-Monitoring at the Gude Landfill, with respect to the Nature and Extent Study.

**Action and Follow-Up Items**

- 1) DEP to provide a summary list of action items (Draft Amendment Plan) related to additional information and clarifications to the NES Report as requested by MDE. This summary list will be used by DEP and MDE as points of agreement to finalize the NES.

*The above summation is the writer's interpretation of the items discussed at the meeting. Comments involving differences in understanding of any of the meeting items will be received for a period of thirty (30) days from the date of these meeting minutes. Clarifications will be made, as deemed necessary. If no comments are received within the specified time period, the minutes will remain as written.*

**ATTACHMENT 1**



## Meeting Agenda - Gude Landfill

(prepared by A. Grenzer MDE)

- Nature and Extent Study Report
  - Chromium in wells WM-9, WM-10 and MW-11A
  - TCE in well MW-9
  - Inclusion of wells (MW-1 to MW-13A) and surface water sampling locations (SW-1-SW-5) in semi-annual monitoring pending MDE review
  - Contribution of volatile organic compounds to the groundwater from landfill gas migration
  - Addition of leachate indicator parameters to any future N&E sampling
  - Gude Landfill Concerned Citizens
  
- Remediation Feasibility Memorandum
  - Corrective Measures Alternatives verse remediation alternative (preferred technology)
  - Remediation alternative criteria
  - Corrective Measures Alternative criteria
  
- Surface water toxicity
  - Whole Effluent Toxicity (“WET”) testing
  - Toxicity Reduction Evaluation

**ATTACHMENT 2**



2/23/11

# Gude N3E Meeting

<u>Name</u>	<u>Org</u>	<u>email</u>
Binyam Woldemichael	MDE-	bwoldemichael@mde.state.md.us
Kassa Kebede	MDE	kkebede@mde.state.md.us
Martha Mynson	MDE	mynson@mde.state.md.us
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Andrew Grenzer	MDE	agrenzer@mde.state.md.us
Dave Lake	MCDEP	dave.lake@montgomerycountymd.gov
Stephen Lezinski	MCDEP	Steve.Lezinski@montgomerycountymd.gov
Peter Karasik	MCDEP	peter.karasik@montgomerycountymd.gov
Barb Roeper	EA	broeper@eaest.com
John Kuman	EA	jkuman@eaest.com
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# Gude Landfill – Nature and Extent Study MDE Comments / County Responses

## Documentation to Prepare Amendment No. 1

### BACKGROUND

The Montgomery County (County) Department of Environmental Protection (DEP) submitted a Nature and Extent Study (NES) Report for the Gude Landfill (Landfill) to the Maryland Department of the Environment (MDE) on November 19, 2010. The NES Report was prepared in conjunction with County DEP and EA Engineering, Science, and Technology, Inc. (EA).

On February 23, 2011, representatives of DEP, EA and MDE met to discuss MDE's comments and questions on the NES Report. Based on this meeting, DEP has prepared a consolidated list of MDE Comments and County Responses regarding the NES Report. MDE Comments are listed in ***Bold Italics*** and County Responses are listed in standard font.

This MDE Comment and County Response document will be used by DEP and MDE to provide and document specific guidance on the necessary steps to finalize the NES Report for the Landfill. The additional information and field work required under the MDE Comment and County Response document will be organized and provided to MDE in a consolidated format as Amendment No. 1 to the NES Report.

The NES Report shall be finalized prior to assessing potential corrective measures for the Landfill.

### MDE COMMENTS & COUNTY RESPONSES (ACTION ITEMS)

- 1) ***MDE – Further characterize the nature of potential impacts to groundwater resulting from the Landfill and identify any contributing factors to such impacts. Address the potential impacts of industrial operations along Southlawn lane on groundwater and surface water quality in the vicinity of the Landfill.***
  - County – Will further evaluate and characterize the nature of potential impacts to groundwater from and in the vicinity of the Landfill with respect to origin: Landfill, local heavy industry activity or local urban environment, etc.
  - County – Will further evaluate and identify contributing factors to potential impacts to groundwater from and in the vicinity of the Landfill with respect to source: waste, stormwater infiltration, leachate, surface water runoff in an industrial area or landfill gas, etc.
  - County – Will qualitatively discuss the potential impacts of the industrial operations along Southlawn Lane on surface water and groundwater quality in the vicinity of the Landfill. The discussion will review general area conditions and focus on the potential impacts that may be consistent with or expected from such localized industrial operations. No further field investigations or database searches will be conducted relative to this matter.

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2) ***MDE – Further characterize the extent of potential impacts to groundwater resulting from the Landfill and identify contributing factors to such impacts. The extent of potential impacts should be bounded.***

- County – Will further evaluate, characterize and bound the extent of potential impacts to groundwater with respect to the horizontal and vertical extent through groundwater/surface water sampling data (up gradient/down gradient), groundwater monitoring well screen elevation data, computerized modeling or other defensible explanations regarding site constraints in the vicinity of the Landfill. With respect to the vertical extent of potential impacts to groundwater, no additional drilling activities beyond permanent or temporary groundwater monitoring locations will be conducted to determine this limit. The vertical extent of potential impacts to groundwater will be determined using either the screened depth elevation of the groundwater monitoring well below ground surface (bgs) or the static groundwater level bgs recorded at the groundwater monitoring well.
- County – Will further assess and bound the extent of potential impacts to groundwater in the following areas of and in vicinity of the Landfill site: northwest, northeast, south-central and southeast.
- County – Will evaluate and identify potential site features in the vicinity of the Landfill, which may act as barriers to potentially limit the migration of constituents that exceed groundwater protection standards from and in the vicinity of the Landfill. Site features may include surface water bodies (hydraulic barriers).
- County – Will evaluate and identify potential site constraints, which may limit the ability to collect additional site specific data to further characterize the extent of potential impacts from and in the vicinity of the Landfill. Site constraints may include limited site access (e.g. dense undergrowth, treacherous terrain or property access restrictions) to areas beyond the Landfill property boundary.

3) ***MDE – Maximum contaminant level (MCL) exceedances were noted at the Landfill property boundary, beyond the waste footprint and in the Derwood Station Community. The extent of MCL exceedances need to be further evaluated and characterized through additional groundwater sampling and analyses in the following areas of the Landfill site: northwest, northeast, south-central and southeast. Seasonal variation trends in the groundwater sampling data (e.g. fluctuations in constituent concentrations) should also be considered and evaluated.***

- County – Will further assess and bound the extent of potential impacts to groundwater through additional sampling and analyses in the following areas of and in vicinity of the Landfill site: northwest, northeast, south-central and southeast.
- County – Will acquire the necessary permits and land approvals to install and monitor three (3) proposed additional groundwater monitoring wells in the Derwood Station Community, which are to be located northwest of the Landfill property. MW-14A/14B

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are proposed to be installed in Bettendorf Court (shallow/deep well pair down gradient of MW-9). MW-15 (shallow well cross-gradient of MW-9) is proposed to be installed near the intersection of Indianola Drive and Grinnell Drive. The groundwater monitoring wells will be installed using hollow stem auger and/or air rotary drilling techniques: Refer to Figure A – Proposed Additional Groundwater Monitoring Locations.

- County – Will acquire the necessary permits and land approvals to install and monitor ten (10) proposed temporary groundwater monitoring locations, which are to be located northwest (MW-13A/13B), northeast (OB105, OB04, OB04A), south-central (OB15, OB12, OB11, OB11A, and OB025) and southeast (OB10 and MW-4) of the Landfill property adjacent to and on opposing sides of the neighboring surface water bodies (Crabbs Branch Stream and Southlawn Branch Stream) in areas that may not be accessible by traditional drilling equipment. The proposed temporary groundwater monitoring locations will be installed by either direct push (geo-probe) equipment or through hand augering and will be installed to depth that penetrates the groundwater surface. Refer to Figure A – Proposed Additional Groundwater Monitoring Locations.
- County – Will conduct additional groundwater sampling and/or fate and transport modeling to enable identification or extrapolation of detected constituent concentrations to a non-detect (ND) level or to a level that approaches groundwater protection standards.
- County – Will review and evaluate existing groundwater and surface water sampling data for potential fluctuations in constituent concentrations. The nature and extent of any found fluctuation trends in constituent concentrations will be discussed.

**4) MDE – *The graphical depiction of detected Volatile Organic Compounds (VOCs) on a Total VOC basis for the NES Report Constituents of Concern is a good starting point to assess the extent of potential impacts to groundwater from the Landfill. However, the nature and extent and graphical depictions of other constituents including metals that exceed individual groundwater protection standards should also be provided and discussed. Impacts should be presented at the single constituent (i.e. parameter) level where groundwater protection standards are exceeded. (Although VOCs are potentially discharged to surface water via groundwater, they are not detected in the bordering surface water bodies to the Landfill.)***

- County – Will provide additional Tables, Figures, Maps etc. to present individual constituent concentrations (VOCs, metals, etc.) that exceed groundwater protection standards (MCLs, etc.) for each groundwater monitoring well on and in the vicinity of the Landfill site.
- County – Will provide additional narrative descriptions to characterize the nature and extent of the individual constituents that exceed groundwater protection standards for each groundwater monitoring well of the Landfill site. General trends analyses of historical groundwater monitoring data, NES monitoring data and recent County semi-annual monitoring data will be conducted for constituents that exceed groundwater protection standards and provided in a consolidated format (e.g. tabular).

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- County – Given minor variations in the NES and County semi-annual groundwater and surface water sampling event results, the County will evaluate the most meaningful way to present the monitoring data to effectively convey the nature and extent of potential groundwater impacts.
- 5) ***MDE – The NES Report should more thoroughly address the source of metals exceedances, particularly chromium in the groundwater sampling data.***
- County – Will further evaluate and identify potential contributing sources of metal exceedances found in groundwater on and in the vicinity of the Landfill. General trends analyses of historical groundwater monitoring data, NES monitoring data and recent County semi-annual monitoring data will be conducted for constituents that exceed groundwater protection standards and provided in a consolidated format (e.g. tabular).
- 6) ***MDE – Groundwater sample turbidity may be interfering with the metals analysis. The NES Report should identify turbidity as an issue and address it accordingly.***
- County – Will evaluate the level of turbidity found in the groundwater monitoring wells and associated groundwater samples as a potential interference factor relative to the metals analyses. The County notes that high turbidity found in the newly installed (16) groundwater monitoring wells may be attributed to the wells being drilled, developed and sampled twice within a relatively short period of time (4-months).
  - County – Will use field filtration for groundwater samples or a longer waiting period for recharge after the 3-volume well purge (up to 24-hours) as a short term evaluation measure to assess turbidity. In the long term, redevelopment may be necessary for certain groundwater monitoring wells.
  - County – Will evaluate and incorporate modifications to the NES groundwater sampling protocol to include filtration of samples and guidelines for monitoring well purging and recharge times, as deemed necessary.
  - County – Will collect filtered and unfiltered groundwater samples as part of the spring semi-annual groundwater and surface water sampling event to evaluate turbidity.
- 7) ***MDE – Although leachate indicator parameters were not required as part of the Landfill NES groundwater sampling program by MDE, such parameters should be included in subsequent sampling and analyses. The leachate indicator parameters include: pH, alkalinity, hardness, chloride, specific conductance, nitrate, Chemical Oxygen Demand (COD), turbidity, ammonia, sulfate and total dissolved solids. Future semi-annual groundwater sampling events performed by the County should include the original (20) and newly installed (16) groundwater monitoring wells until further notice.***
- County – Will include the above referenced leachate indicator parameters for future NES groundwater sampling events at the Landfill. The County notes that the referenced

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leachate indicator parameters are included in the County's MDE approved Groundwater and Surface Water Monitoring Plan and Program (most recent semi-annual event dated September 2010).

- County – Will include the original (20) and newly installed (16) groundwater monitoring wells into future semi-annual groundwater sampling events for the Landfill until further notice by MDE.

**8) MDE – *The Landfill site topographic map that was provided in the Waste Delineation Study (as revised to date) should be used as the base map for presenting: groundwater contour data, groundwater sampling data and for delineating the locations of bordering surface water bodies.***

- County – Will transpose groundwater contour data and groundwater sampling data onto the Landfill site topographic map as it pertains to this Comment and Response Document and associated Amendment No. 1 to the NES Report.
- County – Will use the Landfill site topographic map to delineate the locations of bordering surface water bodies (i.e. Crabbs Branch Stream and Southlawn Branch Stream) to the Landfill.

**9) MDE – *The NES Report groundwater contour map and related text should more closely reflect aspects of the Landfill's topography and the apparent flow direction of surface water bodies along the perimeter Landfill property boundary. More localized (e.g. radial) groundwater flow components in these areas of the Landfill site should be provided in an attempt to close the groundwater contours. Surface water elevations from bordering streams should be measured and included in the groundwater contour details.***

- County – Will review the topographic survey of the Landfill surface and identify applicable elevation data of the site that is related to and can improve the groundwater contour map.
- County – Will install approximately fifteen (15) temporary stream gauges in the surface water bodies along the perimeter Landfill property boundary to obtain stream elevation data for incorporation into the groundwater contour map. The stream gauges will be tied into the Landfill site topography through field survey from the existing groundwater monitoring wells along the northwest/northeast, and south central/southeast Landfill property boundary. Refer to Figure B – Proposed Stream Gauge Locations.
- The groundwater contour map will incorporate the relationship of site topography and the apparent flow direction of surface water bodies along the perimeter property boundary of the Landfill. Where possible, more localized (e.g., radial) groundwater flow components will be addressed in these areas of the Landfill site in an attempt to “close” the groundwater contours.

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MDE Comments / County Responses**

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***10) MDE – The NES Report should address landfill surface hydrology. Specifically the way in which the Landfill’s topography and existing stormwater drainage structures minimize standing water (e.g. ponding) and infiltration into the waste mass.***

- County – Will review the topographic survey of the Landfill surface (e.g. general elevation, slope, etc.) and discuss the relative effects on stormwater diversion, which minimizes the potential for standing water and infiltration.
- County – Will review and describe the existing stormwater drainage network of the Landfill’s cover system and discuss the relative effects on stormwater diversion, which minimizes the potential for standing water and infiltration. Specific references will be made to the Technical Memorandums included in the NES Report that detail stormwater and leachate seep management practices on the Landfill site.
- County – Will not perform any infiltration testing or modeling of the existing Landfill soil cover system.

***11) MDE – Previous and recent upgrades to the landfill gas collection system have proven to be effective measures for mitigating the migration of landfill gas beyond the Landfill property boundary. The County may want to compare landfill gas composition data (if available) with groundwater monitoring data to evaluate the potential positive effects of enhanced landfill gas collection on groundwater quality.***

- County – Will perform a qualitative data comparison of existing landfill gas composition data and existing groundwater monitoring data of the Landfill. VOCS will be compared on a standard detect/non-detect basis, constituent by constituent. The landfill gas composition data was collected and analyzed by SCS Engineers in 2008 via the EPA TO-15 test method for VOCs in air.
- County – Will not collect or analyze any additional landfill gas samples as part of this qualitative comparison.

**MDE COMMENTS & COUNTY RESPONSES (NON-ACTION ITEMS)**

***12) MDE – Human Health and Ecological Risk Evaluations are not typical submissions in a NES Report, which more specifically deal with the nature and extent of potential impacts resulting from contamination from a Landfill.***

- County – The Risk Evaluations were conducted to provide the County, GLCC/Derwood Station Community and MDE with information regarding the potential for adverse impacts to human health and ecological health resulting from and in the vicinity of the Landfill. The Risk Evaluations were pertinent to the County’s relationship and on-going dialog with the GLCC and the neighboring Derwood Station Community.

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***13) MDE – Discussed the potential application of sampling and analysis of groundwater via Bio-Monitoring test procedures (Whole Effluent Toxicity Testing and Toxicity Reduction Evaluation).***

- County – EA responded that Bio-Monitoring is typically used to assess point source discharges into surface water bodies, not area discharges or potential discharges from groundwater to a surface water body. EA noted that while VOCs are potentially discharged to surface water via groundwater, they are not detected in the bordering surface water bodies to the Landfill. EA also noted that an ecological risk evaluation was included as part of the NES Report, which may provide some related information for MDE review.
- MDE – Agreed to defer the discussion of possible Bio-Monitoring of groundwater to a separate meeting with MDE Science Services Administration.
- County – On February 24, 2011, at approximately 3:18 PM, Steve Lezinski received a call from Ed Carlson of MDE. Mr. Carlson stated that after internal MDE evaluation, the County does not have to perform Bio-Monitoring at the Gude Landfill, with respect to the Nature and Extent Study.
- County – It is the understanding of the County that MDE has reviewed the surface water sampling data and Ecological Risk Evaluation from the NES Report and has concluded that no further assessments on potential surface water impacts from or in the vicinity of the Landfill are required at this time.

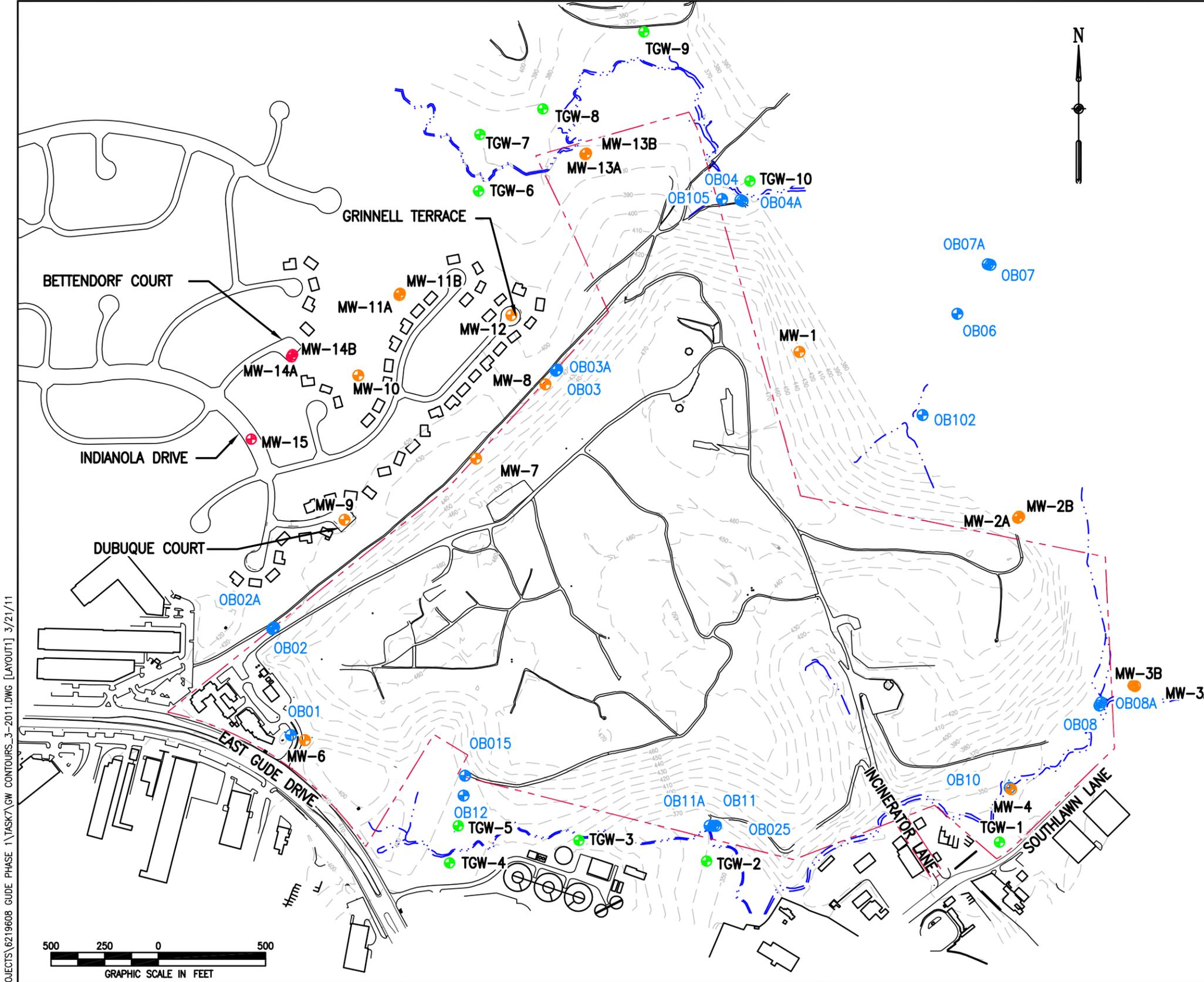
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**LEGEND**

- + OBXX EXISTING GROUNDWATER MONITORING WELL (INSTALLED PRIOR TO 2010)
- + MW-XX NEW GROUNDWATER MONITORING WELL (INSTALLED IN 2010)
- + MW-XX PROPOSED GROUNDWATER MONITORING WELL
- + TGW-XX PROPOSED TEMPORARY GROUNDWATER MONITORING LOCATION
- PROPERTY BOUNDARY
- - - TOPOGRAPHIC CONTOUR (10 FT)
- STREAM

**NOTES:**

1. BOUNDARY AND FIELD SURVEY PERFORMED BY C.C. JOHNSON & MALHOTRA, P.C. OCTOBER 2009.
2. SURVEY OF STREAMS TAKEN FROM 2007 PHOTOGRAMMETRY BY AXIS GEOSPATIAL, LLC.
3. COORDINATE SYSTEM IS NAD-83/91 MARYLAND STATE PLANE.
4. PROPOSED GROUNDWATER MONITORING WELLS WILL BE INSTALLED BY A HSA OR AIR ROTARY DRILL RIG.
5. PROPOSED TEMPORARY GROUNDWATER MONITORING LOCATIONS WILL BE INSTALLED EITHER BY DIRECT PUSH OR HAND AUGERING.
6. PROPOSED GROUNDWATER MONITORING WELLS AND PROPOSED TEMPORARY GROUNDWATER MONITORING LOCATIONS MAY BE ADJUSTED BASED ON AN UNDERGROUND UTILITY SURVEY, FIELD CONDITIONS AND/OR PROPERTY ACCESS RESTRICTIONS.



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GUDE LANDFILL  
MONTGOMERY COUNTY, MARYLAND

FIGURE-A  
NATURE AND EXTENT STUDY AMENDMENT NO. 1  
PROPOSED ADDITIONAL GROUNDWATER MONITORING LOCATIONS

DESIGNED BY PL	DRAWN BY JP	DATE MARCH 2011	PROJECT NO. 62196.08
CHECKED BY BR	PROJECT MGR. JK	DRAWING NO.	FIGURE A

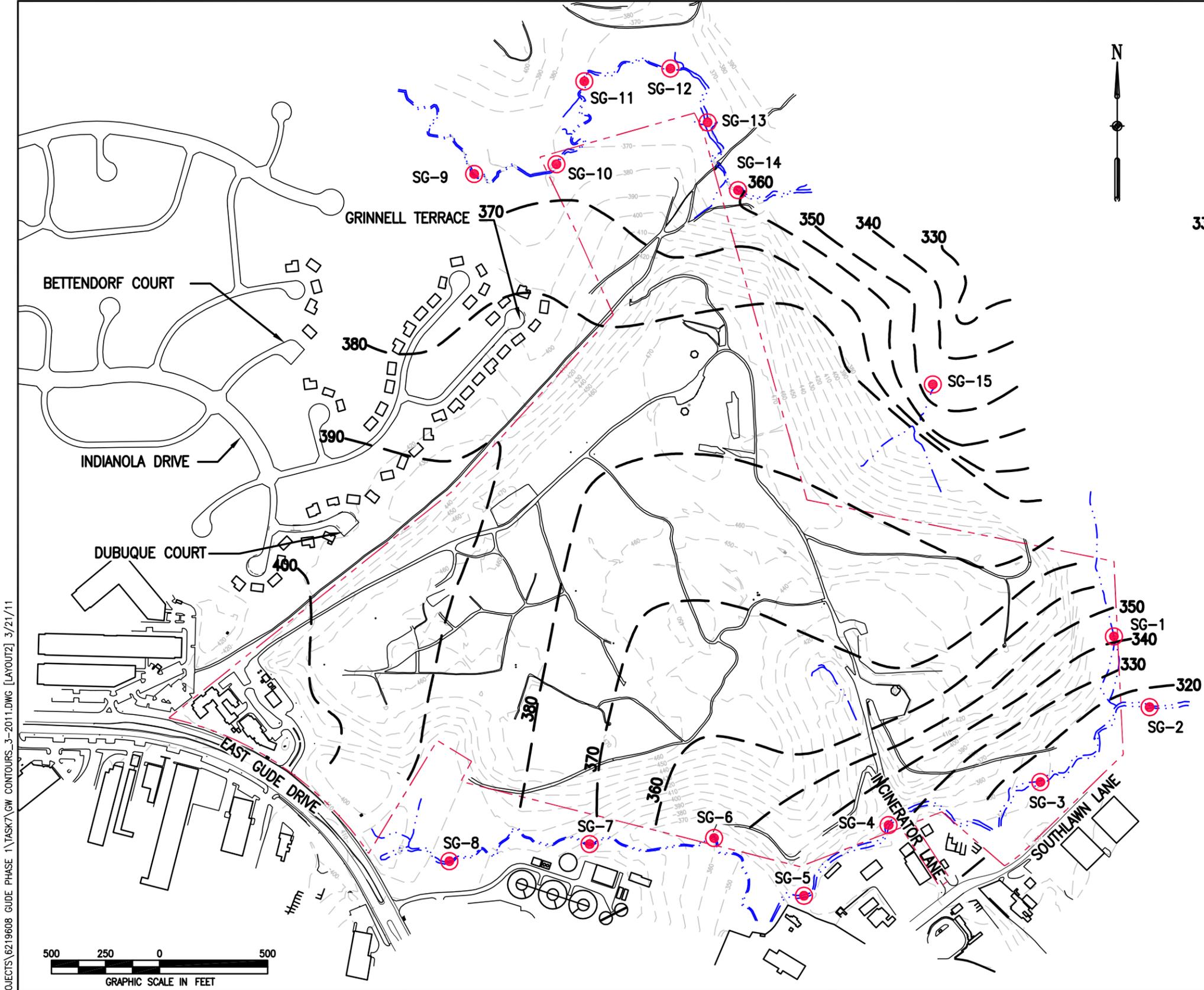
**LEGEND**

- SG-XX PROPOSED STREAM GAUGE LOCATIONS
- PROPERTY BOUNDARY
- - - TOPOGRAPHIC CONTOUR (10 FT)
- STREAM
- 330 --- JULY 2010 INFERRED GROUNDWATER ELEVATION CONTOURS



**NOTES:**

1. BOUNDARY AND FIELD SURVEY PERFORMED BY C.C. JOHNSON & MALHOTRA, P.C. OCTOBER 2009.
2. SURVEY OF STREAMS TAKEN FROM 2007 PHOTOGRAMMETRY BY AXIS GEOSPATIAL, LLC.
3. COORDINATE SYSTEM IS NAD-83/91 MARYLAND STATE PLANE.
4. PROPOSED STREAM GAUGE LOCATION MAY BE ADJUSTED IN THE FIELD BASED ON LINE-OF-SIGHT CONDITIONS AND/OR PROPERTY ACCESS RESTRICTIONS.



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GUDE LANDFILL  
MONTGOMERY COUNTY, MARYLAND

FIGURE-B  
NATURE AND EXTENT STUDY AMENDMENT NO. 1  
PROPOSED STREAM GAUGE LOCATIONS

DESIGNED BY PL	DRAWN BY JP	DATE MARCH 2011	PROJECT NO. 62196.08
CHECKED BY BR	PROJECT MGR. JK	DRAWING NO.	FIGURE B