Environmental Compliance and Remediation

Babb & Associates, P.A.

December 12, 2015

Ms. Jackie Drummond, Hydrogeologist
NC Solid Waste Section, Asheville Regional Office
2090 US Highway 70
Swannanoa, NC 28778

Re: Request to Modify Groundwater Monitoring System
City of Lexington Closed Landfill
Lexington, North Carolina
Permit #29-03

Dear Ms. Drummond:

The City of Lexington Closed Landfill is located approximately two miles northeast of downtown Lexington, North Carolina on State Road 2001 in Davidson County, North Carolina. The landfill ceased operation on May 1, 1990 and was closed by capping the fill with a four-foot thick final cover using native soils. Properties adjacent to the closed landfill are either undeveloped woodland or farmland (Figure 1).

The City of Lexington has been providing post-closure care and monitoring of the landfill since closure in 1990. The water quality monitoring program for the closed landfill consists of semi-annual sampling and analyses of thirteen groundwater monitoring wells and two surface water monitoring stations (Figure 2). The monitoring well network was expanded during groundwater assessment activities in December 1996 and by the addition of a new off-site background monitoring well (MW-11) in January 1998.

The purpose of this correspondence is to request a reduction in the frequency of groundwater and surface water monitoring as well as a reduction in the groundwater monitoring wells sampled during the monitoring events.

Modifications to Monitoring System

Groundwater flow at the landfill site is from the northern portion of the property, along the railroad right-of-way, to the south where the shallow groundwater discharges to Abbotts Creek (Figure 2). The direction of groundwater flow and horizontal hydraulic gradient has remained stable and unchanged during the post-closure care period. Based

P.O. Box 37697
Raleigh, NC 27627
(919) 325-0696

on the observed direction of groundwater flow, there are six shallow downgradient monitoring wells at the landfill site. These wells include MW-2, MW-3, MW-7, MW-8, MW-9, and MW-10. It should be noted that monitoring wells MW-2 and MW-3 are two of the original site monitoring wells and are installed in the earthen dike constructed for the landfill operations.

Groundwater monitoring wells MW-4, MW-5, MW-6, and MW-12 are located on the northern portion of the property and are hydraulically upgradient of the former landfill area. These wells are not capable of monitoring the downgradient effects of the former landfill on groundwater quality. Due to the close proximity of these four wells to the former landfill operations, these wells do not provide reliable background groundwater quality or serve as acceptable compliance monitoring points.

Based on these observations, we request removal of the following groundwater monitoring wells from the post-closure detection monitoring program:

MW-4	MW-5
MW-6	MW-7D
MW-10D	MW-12

The requested water quality monitoring network for future sampling and analyses events is proposed to consist of the following point of compliance monitoring stations:

MW-11 (background)	MW-2
MW-3	MW-7
MW-8	MW-9
MW-10	
SW-1 (background)	SW-2

These groundwater monitoring wells and surface water monitoring stations will be sampled and analyzed for the Appendix I detection monitoring parameters specified by 15A NCAC 13B .1633(a).

Modifications to Monitoring Frequency

The existing groundwater at surface water monitoring network has been evaluated on a semi-annual basis during the post-closure period which began in 1990. The water quality monitoring network was substantially modified during the 1996 Groundwater and Surface Water Assessment which resulted in the addition of several new monitoring wells. At two of the monitoring locations (MW-7 and MW-10), nested pairs of groundwater monitoring wells were installed. These monitoring nests, shallow and deeper wells, were used to evaluate the vertical extent of potential contamination. Information obtained from these nested well pairs indicates the MW-7/7D wells are in a groundwater recharge zone while the MW-10/10D wells are in a groundwater discharge zone.

An evaluation of the water quality from the hydraulically downgradient monitoring wells at the site (MW-2, MW-3, MW-7, MW-8, MW-9, and MW-10) indicate only minor concentrations of volatile organic contaminants reported during the post-closure monitoring period. The monitoring well which has shown the highest concentration of volatile organic contaminant is MW-7, which is a side-gradient well located on the eastern boundary of the landfill property. The reported concentration of total volatile organic contaminants in monitoring well MW-7 has shown a decreasing trend, from a high of 33 ug/l in May 2005 to less than 15 ug/l over the past four monitoring events. A similar trend is observed in downgradient monitoring well MW-2, which has shown a reduction in the concentration of total volatile organic contaminants from 31 ug/l in October 2007 to below laboratory detection limits over the past four monitoring events. The overall trend of total volatile organic contaminant concentrations at the landfill site has shown a significant decrease over the past ten years of post-closure monitoring.

The inorganic analyses of the downgradient groundwater monitoring wells have also shown minor concentrations of naturally occurring compounds. The reported concentrations of inorganic compounds has occasionally exceeded the established NC 2L Groundwater Standard; however, the results are not consistent and likely represent entrained sediment in the water sample. No indication of a significant of inorganic contamination is indicated by the historic groundwater analyses in the hydraulically downgradient monitoring wells.

Finally, the laboratory analyses of surface water samples over the past ten years have not reported any concentrations of volatile organic contamination or naturally occurring inorganic compounds above the NC 2B Surface Water Standards.

An evaluation of the groundwater conditions at the landfill site indicates the hydraulically downgradient groundwater quality is stable with a general decreasing trend in contaminant concentrations. Based on this information, we request a reduction in the water quality monitoring frequency from semi-annual to annually. The observed water quality monitoring results over the post-closure care period indicates that an annual monitoring event will be protective of human health and the environment while providing a representative measure of groundwater and surface water quality.

Conclusions

After a review of the hydrogeologic conditions, results of past assessment activities, historical water quality results of groundwater and surface water, and observed contaminant trends, the City of Lexington requests modification to the water quality monitoring program for the closed landfill. The requested modifications include:

- Reduction in the monitoring wells used for water quality monitoring. The proposed groundwater and surface water detection monitoring network includes:

MW-11 (background)	MW-2
MW-3	MW-7
MW-8	MW-9
MW-10	
SW-1 (background)	SW-2

- A reduction in the frequency of water quality monitoring from semi-annual to an annual basis. Based on the stability of the observed contaminants and the decreasing trend in contaminant concentration over the post-closure period, annual monitoring will provide for an adequate evaluation of the effects of the closed landfill on groundwater and surface water quality.

The City of Lexington appreciates your time and consideration of this request. If there are any questions regarding this request or if additional information is needed, please contact the undersigned at (919) 325-0696.

Respectfully,

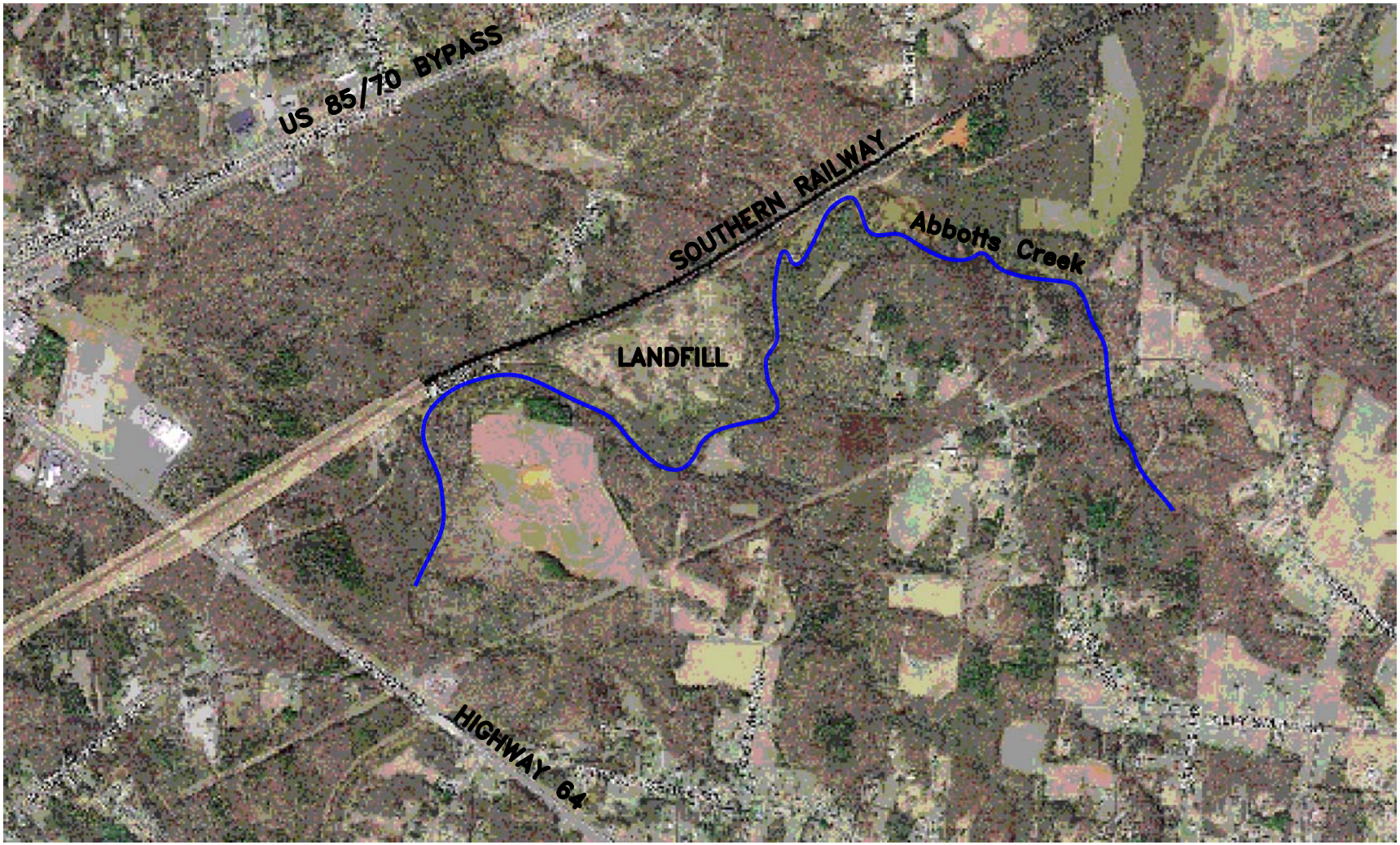
Babb & Associates, P.A.

Gary D. Babb, P.G.
President

NORTH CAROLINA LICENSED SEAL 488 GEOLOGIST GARY D. BABB

Attachments

cc: Ms. Gisele Comer
City of Lexington



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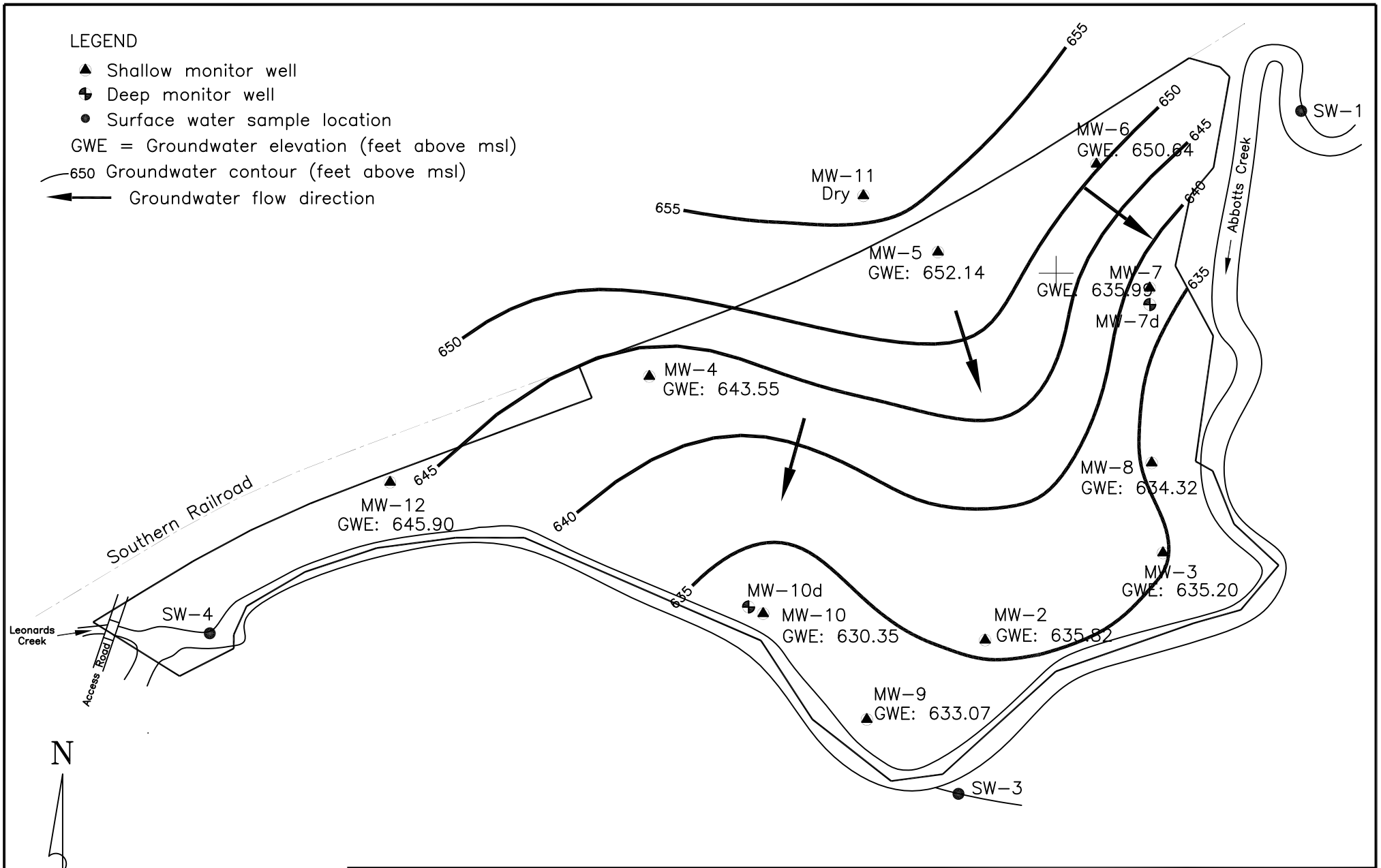
TITLE:	FIGURE NO:	SCALE:	PROJECT NO:
LOCATION MAP City of Lexington Closed Landfill State Road 2001 Lexington, North Carolina	Figure 1	1"=1000'	
	CHECKED BY:	DRAWN BY: GDB	DATE: 11/12/15



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TITLE:	FIGURE NO:	SCALE:	PROJECT NO:
POTENTIOMETRIC MAP October 2015 Monitoring Event City of Lexington Closed Landfill State Road 2001 Lexington, North Carolina	Figure 2	1"=400'	LL
	CHECKED BY:	DRAWN BY:	DATE:
		GDB	10/12/15