Phase 1 No-Build AM
1: Route 55 & Wheeler Road/Wheeler Rd

9/3/2015

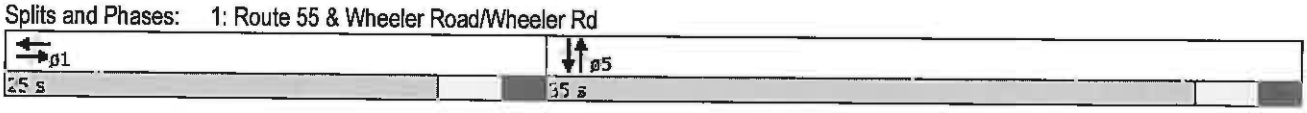
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	30	0	20	5	6	12	16	403	0	6	613	48
Satd. Flow (prot)	0	1711	0	0	1715	0	0	1859	0	0	1844	0
Flt Permitted		0.862			0.965			0.968			0.996	
Satd. Flow (perm)	0	1519	0	0	1672	0	0	1803	0	0	1837	0
Satd. Flow (RTOR)		36			13						9	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	55	0	0	25	0	0	455	0	0	725	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		1			1			5			5	
Permitted Phases	1			1			5			5		
Total Split (s)	25.0	25.0		25.0	25.0		35.0	35.0		35.0	35.0	
Total Lost Time (s)		5.0			5.0			5.0			5.0	
Act Effct Green (s)		20.0			20.0			30.0			30.0	
Actuated g/C Ratio		0.33			0.33			0.50			0.50	
v/c Ratio		0.10			0.04			0.50			0.79	
Control Delay		8.1			9.8			12.5			20.3	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		8.1			9.8			12.5			20.3	
LOS		A			A			B			C	
Approach Delay		8.1			9.8			12.5			20.3	
Approach LOS		A			A			B			C	
Queue Length 50th (ft)		5			3			102			197	
Queue Length 95th (ft)		25			17			172			#388	
Internal Link Dist (ft)		1394			1015			902			1804	
Turn Bay Length (ft)												
Base Capacity (vph)		530			566			901			923	
Starvation Cap Reductn		0			0			0			0	
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.10			0.04			0.50			0.79	

Intersection Summary

Cycle Length: 60
Actuated Cycle Length: 60
Offset: 29 (48%), Referenced to phase 6 : Start of Green
Control Type: Pretimed
Maximum v/c Ratio: 0.79
Intersection Signal Delay: 16.7 — Intersection LOS: B
Intersection Capacity Utilization 52.5% — ICU Level of Service A
Analysis Period (min) 15

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: Route 55 & Wheeler Road/Wheeler Rd

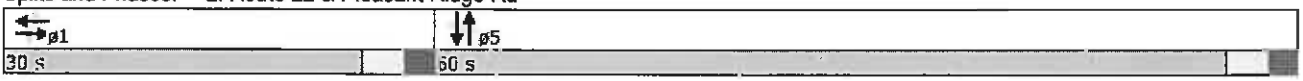


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	92	47	20	10	43	77	16	304	16	48	340	44
Satd. Flow (prot)	0	1780	0	0	1707	0	0	1848	0	0	1826	0
Flt Permitted		0.737			0.975			0.974			0.927	
Satd. Flow (perm)	0	1350	0	0	1671	0	0	1803	0	0	1703	0
Satd. Flow (RTOR)		8			80			5			12	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	173	0	0	142	0	0	364	0	0	470	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		1			1			5			5	
Permitted Phases	1			1			5			5		
Total Split (s)	30.0	30.0		30.0	30.0		60.0	60.0		60.0	60.0	
Total Lost Time (s)		5.0			5.0			5.0			5.0	
Act Effct Green (s)		25.0			25.0			55.0			55.0	
Actuated g/C Ratio		0.28			0.28			0.61			0.61	
v/c Ratio		0.46			0.27			0.33			0.45	
Control Delay		30.2			13.6			9.4			10.8	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		30.2			13.6			9.4			10.8	
LOS		C			B			A			B	
Approach Delay		30.2			13.6			9.4			10.8	
Approach LOS		C			B			A			B	
Queue Length 50th (ft)		77			26			90			127	
Queue Length 95th (ft)		140			72			140			195	
Internal Link Dist (ft)		846			419			539			621	
Turn Bay Length (ft)												
Base Capacity (vph)		380			521			1103			1045	
Starvation Cap Reductn		0			0			0			0	
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.46			0.27			0.33			0.45	

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 90
Offset: 42 (47%), Referenced to phase 6:, Start of Green
Control Type: Pretimed
Maximum v/c Ratio: 0.46
Intersection Signal Delay: 13.6 — Intersection LOS: B
Intersection Capacity Utilization 62.3% — ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 2: Route 22 & Pleasant Ridge Rd



Phase 1 No-Build PM
1: Route 55 & Wheeler Road/Wheeler Rd

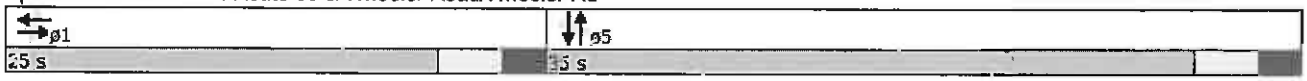
9/3/2015

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	27	5	20	5	5	5	12	572	0	6	394	36
Satd. Flow (prot)	0	1720	0	0	1750	0	0	1861	0	0	1840	0
Flt Permitted		0.886			0.945			0.989			0.991	
Satd. Flow (perm)	0	1563	0	0	1681	0	0	1842	0	0	1826	0
Satd. Flow (RTOR)		22			5						11	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	56	0	0	15	0	0	635	0	0	474	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		1			1			5			5	
Permitted Phases	1			1			5			5		
Total Split (s)	25.0	25.0		25.0	25.0		35.0	35.0		35.0	35.0	
Total Lost Time (s)		5.0			5.0			5.0			5.0	
Act Effct Green (s)		20.0			20.0			30.0			30.0	
Actuated g/C Ratio		0.33			0.33			0.50			0.50	
v/c Ratio		0.10			0.03			0.69			0.52	
Control Delay		10.3			11.6			16.3			12.4	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		10.3			11.6			16.3			12.4	
LOS		B			B			B			B	
Approach Delay		10.3			11.6			16.3			12.4	
Approach LOS		B			B			B			B	
Queue Length 50th (ft)		8			2			162			104	
Queue Length 95th (ft)		29			13			269			175	
Internal Link Dist (ft)		1394			1015			902			1804	
Turn Bay Length (ft)												
Base Capacity (vph)		535			563			921			918	
Starvation Cap Reductn		0			0			0			0	
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.10			0.03			0.69			0.52	

Intersection Summary

Cycle Length: 60
Actuated Cycle Length: 60
Offset: 29 (48%), Referenced to phase 6 , Start of Green
Control Type: Pretimed
Maximum v/c Ratio: 0.69
Intersection Signal Delay: 14.4 — Intersection LOS: B
Intersection Capacity Utilization 50.1% — ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 1: Route 55 & Wheeler Road/Wheeler Rd



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	32	62	15	5	43	45	16	362	8	65	299	57
Satd. Flow (prot)	0	1802	0	0	1738	0	0	1853	0	0	1815	0
Flt Permitted		0.898			0.989			0.977			0.882	
Satd. Flow (perm)	0	1643	0	0	1723	0	0	1814	0	0	1613	0
Satd. Flow (RTOR)		9			49			2			16	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	118	0	0	101	0	0	419	0	0	458	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		1			1			5			5	
Permitted Phases	1			1			5			5		
Total Split (s)	30.0	30.0		30.0	30.0		60.0	60.0		60.0	60.0	
Total Lost Time (s)		5.0			5.0			5.0			5.0	
Act Effct Green (s)		25.0			25.0			55.0			55.0	
Actuated g/C Ratio		0.28			0.28			0.61			0.61	
v/c Ratio		0.26			0.20			0.38			0.46	
Control Delay		25.1			15.1			10.0			11.0	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		25.1			15.1			10.0			11.0	
LOS		C			B			B			B	
Approach Delay		25.1			15.1			10.0			11.0	
Approach LOS		C			B			B			B	
Queue Length 50th (ft)		48			22			109			124	
Queue Length 95th (ft)		93			61			166			193	
Internal Link Dist (ft)		846			419			539			621	
Turn Bay Length (ft)												
Base Capacity (vph)		462			514			1109			991	
Starvation Cap Reductn		0			0			0			0	
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.26			0.20			0.38			0.46	

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 90
Offset: 42 (47%), Referenced to phase 6 , Start of Green
Control Type: Pretimed
Maximum v/c Ratio: 0.46
Intersection Signal Delay: 12.5 Intersection LOS: B
Intersection Capacity Utilization 67.4% ICU Level of Service C
Analysis Period (min) 15

Splits and Phases: 2: Route 22 & Pleasant Ridge Rd

Phase 1 Build AM

1: Route 55 & Wheeler Road/Wheeler Rd

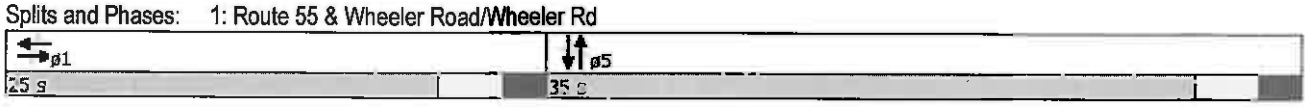
9/3/2015

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	30	0	20	16	6	18	16	404	44	30	616	48
Satd. Flow (prot)	0	1711	0	0	1716	0	0	1835	0	0	1842	0
Flt Permitted		0.854			0.914			0.970			0.967	
Satd. Flow (perm)	0	1505	0	0	1599	0	0	1783	0	0	1785	0
Satd. Flow (RTOR)		36			20			13			9	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	55	0	0	44	0	0	504	0	0	755	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		1			1			5			5	
Permitted Phases	1			1			5			5		
Total Split (s)	25.0	25.0		25.0	25.0		35.0	35.0		35.0	35.0	
Total Lost Time (s)		5.0			5.0			5.0			5.0	
Act Effct Green (s)		20.0			20.0			30.0			30.0	
Actuated g/C Ratio		0.33			0.33			0.50			0.50	
v/c Ratio		0.10			0.08			0.56			0.84	
Control Delay		8.1			9.8			13.2			24.1	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		8.1			9.8			13.2			24.1	
LOS		A			A			B			C	
Approach Delay		8.1			9.8			13.2			24.1	
Approach LOS		A			A			B			C	
Queue Length 50th (ft)		5			6			113			215	
Queue Length 95th (ft)		25			24			193			#426	
Internal Link Dist (ft)		1394			1015			567			1804	
Turn Bay Length (ft)												
Base Capacity (vph)		525			546			898			897	
Starvation Cap Reductn		0			0			0			0	
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.10			0.08			0.56			0.84	

Intersection Summary

Cycle Length: 60
Actuated Cycle Length: 60
Offset: 29 (48%), Referenced to phase 6 : Start of Green
Control Type: Pretimed
Maximum v/c Ratio: 0.84
Intersection Signal Delay: 18.9 — Intersection LOS: B
Intersection Capacity Utilization 60.5% — ICU Level of Service B
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: Route 55 & Wheeler Road/Wheeler Rd



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	92	47	28	10	43	77	18	309	16	48	351	44
Satd. Flow (prot)	0	1773	0	0	1707	0	0	1846	0	0	1829	0
Flt Permitted		0.746			0.975			0.967			0.927	
Satd. Flow (perm)	0	1359	0	0	1671	0	0	1790	0	0	1704	0
Satd. Flow (RTOR)		11			80			5			11	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	181	0	0	142	0	0	373	0	0	482	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		1			1			5			5	
Permitted Phases	1			1			5			5		
Total Split (s)	30.0	30.0		30.0	30.0		60.0	60.0		60.0	60.0	
Total Lost Time (s)		5.0			5.0			5.0			5.0	
Act Effct Green (s)		25.0			25.0			55.0			55.0	
Actuated g/C Ratio		0.28			0.28			0.61			0.61	
v/c Ratio		0.47			0.27			0.34			0.46	
Control Delay		30.1			13.6			9.5			11.0	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		30.1			13.6			9.5			11.0	
LOS		C			B			A			B	
Approach Delay		30.1			13.6			9.5			11.0	
Approach LOS		C			B			A			B	
Queue Length 50th (ft)		80			26			93			132	
Queue Length 95th (ft)		144			72			145			202	
Internal Link Dist (ft)		846			419			539			621	
Turn Bay Length (ft)												
Base Capacity (vph)		385			521			1095			1045	
Starvation Cap Reductn		0			0			0			0	
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.47			0.27			0.34			0.46	

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 90
Offset: 42 (47%), Referenced to phase 6:, Start of Green
Control Type: Pretimed
Maximum v/c Ratio: 0.47
Intersection Signal Delay: 13.8 — Intersection LOS: B
Intersection Capacity Utilization 62.3% — ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 2: Route 22 & Pleasant Ridge Rd

Phase 1 Build PM
1: Route 55 & Wheeler Road/Wheeler Rd

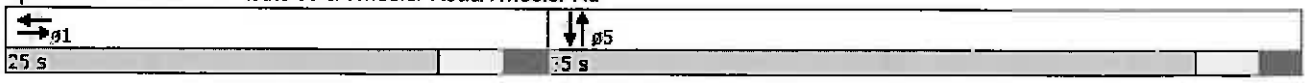
9/3/2015

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	27	5	20	65	5	38	12	575	18	16	395	36
Satd. Flow (prot)	0	1720	0	0	1724	0	0	1853	0	0	1839	0
Flt Permitted		0.850			0.811			0.989			0.973	
Satd. Flow (perm)	0	1499	0	0	1440	0	0	1835	0	0	1793	0
Satd. Flow (RTOR)		22			41			4			10	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	56	0	0	117	0	0	658	0	0	485	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		1			1			5			5	
Permitted Phases	1			1			5			5		
Total Split (s)	25.0	25.0		25.0	25.0		35.0	35.0		35.0	35.0	
Total Lost Time (s)		5.0			5.0			5.0			5.0	
Act Effct Green (s)		20.0			20.0			30.0			30.0	
Actuated g/C Ratio		0.33			0.33			0.50			0.50	
v/c Ratio		0.11			0.23			0.72			0.54	
Control Delay		10.4			11.4			17.1			12.8	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		10.4			11.4			17.1			12.8	
LOS		B			B			B			B	
Approach Delay		10.4			11.4			17.1			12.8	
Approach LOS		B			B			B			B	
Queue Length 50th (ft)		8			19			170			108	
Queue Length 95th (ft)		29			51			285			183	
Internal Link Dist (ft)		1394			1015			567			1804	
Turn Bay Length (ft)												
Base Capacity (vph)		514			507			919			901	
Starvation Cap Reductn		0			0			0			0	
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.11			0.23			0.72			0.54	

Intersection Summary

Cycle Length: 60
Actuated Cycle Length: 60
Offset: 29 (48%), Referenced to phase 6 , Start of Green
Control Type: Pretimed
Maximum v/c Ratio: 0.72
Intersection Signal Delay: 14.7 — Intersection LOS: B
Intersection Capacity Utilization 52.5% — ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 1: Route 55 & Wheeler Road/Wheeler Rd



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	32	62	18	5	43	45	26	378	8	65	304	57
Satd. Flow (prot)	0	1796	0	0	1738	0	0	1852	0	0	1815	0
Flt Permitted		0.901			0.989			0.958			0.877	
Satd. Flow (perm)	0	1641	0	0	1723	0	0	1779	0	0	1604	0
Satd. Flow (RTOR)		11			49			2			16	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	122	0	0	101	0	0	448	0	0	463	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		1			1			5			5	
Permitted Phases	1			1			5			5		
Total Split (s)	30.0	30.0		30.0	30.0		60.0	60.0		60.0	60.0	
Total Lost Time (s)		5.0			5.0			5.0			5.0	
Act Effct Green (s)		25.0			25.0			55.0			55.0	
Actuated g/C Ratio		0.28			0.28			0.61			0.61	
v/c Ratio		0.26			0.20			0.41			0.47	
Control Delay		24.8			15.1			10.5			11.1	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		24.8			15.1			10.5			11.1	
LOS		C			B			B			B	
Approach Delay		24.8			15.1			10.5			11.1	
Approach LOS		C			B			B			B	
Queue Length 50th (ft)		49			22			120			126	
Queue Length 95th (ft)		95			61			182			196	
Internal Link Dist (ft)		846			419			539			621	
Turn Bay Length (ft)												
Base Capacity (vph)		463			514			1087			986	
Starvation Cap Reductn		0			0			0			0	
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.26			0.20			0.41			0.47	

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 90
Offset: 42 (47%), Referenced to phase 6 , Start of Green
Control Type: Pretimed
Maximum v/c Ratio: 0.47
Intersection Signal Delay: 12.7 Intersection LOS: B
Intersection Capacity Utilization 62.0% ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 2: Route 22 & Pleasant Ridge Rd

ø1	ø5
30 s	60 s

Full Buildout No-Build AM
1: Route 55 & Wheeler Road/Wheeler Rd

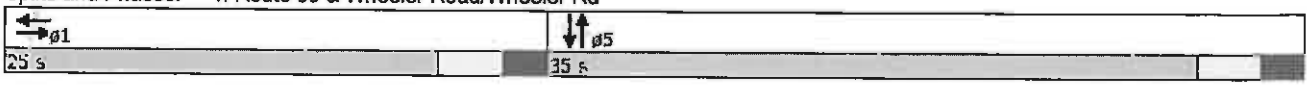
9/3/2015

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	31	0	21	5	6	12	17	475	0	6	737	49
Satd. Flow (prot)	0	1711	0	0	1715	0	0	1859	0	0	1848	0
Flt Permitted		0.861			0.965			0.965			0.996	
Satd. Flow (perm)	0	1517	0	0	1672	0	0	1798	0	0	1840	0
Satd. Flow (RTOR)		36			13						8	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	57	0	0	25	0	0	534	0	0	861	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		1			1			5			5	
Permitted Phases	1			1			5			5		
Total Split (s)	25.0	25.0		25.0	25.0		35.0	35.0		35.0	35.0	
Total Lost Time (s)		5.0			5.0			5.0			5.0	
Act Effct Green (s)		20.0			20.0			30.0			30.0	
Actuated g/C Ratio		0.33			0.33			0.50			0.50	
v/c Ratio		0.11			0.04			0.59			0.93	
Control Delay		8.2			9.8			14.1			33.8	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		8.2			9.8			14.1			33.8	
LOS		A			A			B			C	
Approach Delay		8.2			9.8			14.1			33.8	
Approach LOS		A			A			B			C	
Queue Length 50th (ft)		5			3			127			267	
Queue Length 95th (ft)		26			17			212			#510	
Internal Link Dist (ft)		1394			1015			902			1804	
Turn Bay Length (ft)												
Base Capacity (vph)		529			566			899			924	
Starvation Cap Reductn		0			0			0			0	
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.11			0.04			0.59			0.93	

Intersection Summary

Cycle Length: 60
Actuated Cycle Length: 60
Offset: 29 (48%), Referenced to phase 6:, Start of Green
Control Type: Pretimed
Maximum v/c Ratio: 0.93
Intersection Signal Delay: 25.3 — Intersection LOS: C
Intersection Capacity Utilization 59.4% — ICU Level of Service B
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: Route 55 & Wheeler Road/Wheeler Rd



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	103	54	21	10	46	80	17	372	17	49	444	48
Satd. Flow (prot)	0	1782	0	0	1709	0	0	1848	0	0	1833	0
Flt Permitted		0.715			0.975			0.971			0.930	
Satd. Flow (perm)	0	1311	0	0	1673	0	0	1798	0	0	1712	0
Satd. Flow (RTOR)		7			79			4			10	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	194	0	0	148	0	0	440	0	0	588	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		1			1			5			5	
Permitted Phases	1			1			5			5		
Total Split (s)	30.0	30.0		30.0	30.0		60.0	60.0		60.0	60.0	
Total Lost Time (s)		5.0			5.0			5.0			5.0	
Act Effct Green (s)		25.0			25.0			55.0			55.0	
Actuated g/C Ratio		0.28			0.28			0.61			0.61	
v/c Ratio		0.53			0.28			0.40			0.56	
Control Delay		32.6			14.2			10.3			12.7	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		32.6			14.2			10.3			12.7	
LOS		C			B			B			B	
Approach Delay		32.6			14.2			10.3			12.7	
Approach LOS		C			B			B			B	
Queue Length 50th (ft)		90			30			116			177	
Queue Length 95th (ft)		159			78			176			269	
Internal Link Dist (ft)		846			419			539			621	
Turn Bay Length (ft)												
Base Capacity (vph)		369			521			1100			1050	
Starvation Cap Reductn		0			0			0			0	
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.53			0.28			0.40			0.56	

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 90
Offset: 42 (47%), Referenced to phase 6 , Start of Green
Control Type: Pretimed
Maximum v/c Ratio: 0.56
Intersection Signal Delay: 14.9 Intersection LOS: B
Intersection Capacity Utilization 75.7% ICU Level of Service D
Analysis Period (min) 15

Splits and Phases: 2: Route 22 & Pleasant Ridge Rd

Full Buildout No-Build PM
1: Route 55 & Wheeler Road/Wheeler Rd

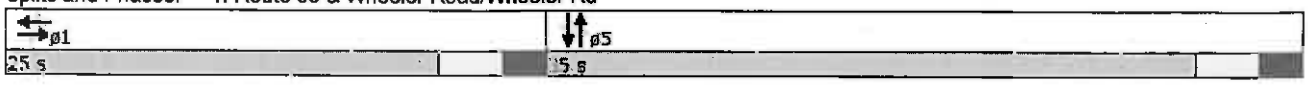
9/3/2015

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	28	5	21	5	5	5	13	706	0	6	475	37
Satd. Flow (prot)	0	1718	0	0	1750	0	0	1861	0	0	1842	0
Flt Permitted		0.885			0.945			0.988			0.991	
Satd. Flow (perm)	0	1560	0	0	1681	0	0	1840	0	0	1828	0
Satd. Flow (RTOR)		23			5						9	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	58	0	0	15	0	0	781	0	0	563	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		1			1			5			5	
Permitted Phases	1			1			5			5		
Total Split (s)	25.0	25.0		25.0	25.0		35.0	35.0		35.0	35.0	
Total Lost Time (s)		5.0			5.0			5.0			5.0	
Act Effct Green (s)		20.0			20.0			30.0			30.0	
Actuated g/C Ratio		0.33			0.33			0.50			0.50	
v/c Ratio		0.11			0.03			0.85			0.61	
Control Delay		10.3			11.6			24.6			14.2	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		10.3			11.6			24.6			14.2	
LOS		B			B			C			B	
Approach Delay		10.3			11.6			24.6			14.2	
Approach LOS		B			B			C			B	
Queue Length 50th (ft)		8			2			226			133	
Queue Length 95th (ft)		30			13			#438			223	
Internal Link Dist (ft)		1394			1015			902			1804	
Turn Bay Length (ft)												
Base Capacity (vph)		535			563			920			918	
Starvation Cap Reductn		0			0			0			0	
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.11			0.03			0.85			0.61	

Intersection Summary

Cycle Length: 60
Actuated Cycle Length: 60
Offset: 29 (48%), Referenced to phase 6:, Start of Green
Control Type: Pretimed
Maximum v/c Ratio: 0.85
Intersection Signal Delay: 19.8 — Intersection LOS: B
Intersection Capacity Utilization 58.2% — ICU Level of Service B
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: Route 55 & Wheeler Road/Wheeler Rd



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	38	67	16	5	50	46	17	480	8	67	375	68
Satd. Flow (prot)	0	1802	0	0	1744	0	0	1855	0	0	1816	0
Flt Permitted		0.886			0.989			0.978			0.874	
Satd. Flow (perm)	0	1621	0	0	1728	0	0	1818	0	0	1599	0
Satd. Flow (RTOR)		8			47			2			16	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	131	0	0	109	0	0	549	0	0	555	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		1			1			5			5	
Permitted Phases	1			1			5			5		
Total Split (s)	30.0	30.0		30.0	30.0		60.0	60.0		60.0	60.0	
Total Lost Time (s)		5.0			5.0			5.0			5.0	
Act Effct Green (s)		25.0			25.0			55.0			55.0	
Actuated g/C Ratio		0.28			0.28			0.61			0.61	
v/c Ratio		0.29			0.21			0.49			0.56	
Control Delay		26.0			16.3			11.6			12.8	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		26.0			16.3			11.6			12.8	
LOS		C			B			B			B	
Approach Delay		26.0			16.3			11.6			12.8	
Approach LOS		C			B			B			B	
Queue Length 50th (ft)		55			26			158			165	
Queue Length 95th (ft)		103			67			236			257	
Internal Link Dist (ft)		846			419			539			621	
Turn Bay Length (ft)												
Base Capacity (vph)		456			513			1111			983	
Starvation Cap Reductn		0			0			0			0	
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.29			0.21			0.49			0.56	

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 90
Offset: 42 (47%), Referenced to phase 6 : Start of Green
Control Type: Pretimed
Maximum v/c Ratio: 0.56
Intersection Signal Delay: 13.9 — Intersection LOS: B
Intersection Capacity Utilization 76.0% — ICU Level of Service D
Analysis Period (min) 15

Splits and Phases: 2: Route 22 & Pleasant Ridge Rd

Full Buildout Build w/o Improve AM
1: Route 55 & Wheeler Road/Wheeler Rd

9/3/2015

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	31	0	21	82	6	53	17	480	268	150	753	49
Satd. Flow (prot)	0	1711	0	0	1718	0	0	1773	0	0	1835	0
Flt Permitted		0.811			0.807			0.973			0.692	
Satd. Flow (perm)	0	1429	0	0	1427	0	0	1727	0	0	1280	0
Satd. Flow (RTOR)		36			54			65			6	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	57	0	0	154	0	0	831	0	0	1034	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		1			1			5			5	
Permitted Phases	1			1			5			5		
Total Split (s)	25.0	25.0		25.0	25.0		35.0	35.0		35.0	35.0	
Total Lost Time (s)		5.0			5.0			5.0			5.0	
Act Effct Green (s)		20.0			20.0			30.0			30.0	
Actuated g/C Ratio		0.33			0.33			0.50			0.50	
v/c Ratio		0.11			0.30			0.93			1.61	
Control Delay		8.3			11.8			32.6			300.7	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		8.3			11.8			32.6			300.7	
LOS		A			B			C			F	
Approach Delay		8.3			11.8			32.6			300.7	
Approach LOS		A			B			C			F	
Queue Length 50th (ft)		5			25			241			~564	
Queue Length 95th (ft)		26			64			#482			#779	
Internal Link Dist (ft)		1394			1015			567			1804	
Turn Bay Length (ft)												
Base Capacity (vph)		500			511			896			643	
Starvation Cap Reductn		0			0			0			0	
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.11			0.30			0.93			1.61	

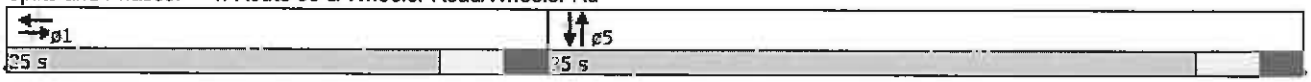
Intersection Summary

Cycle Length: 60
Actuated Cycle Length: 60
Offset: 29 (48%), Referenced to phase 6:, Start of Green
Control Type: Pretimed
Maximum v/c Ratio: 1.61
Intersection Signal Delay: 163.9 — Intersection LOS: F
Intersection Capacity Utilization 115.6% — ICU Level of Service H
Analysis Period (min) 15

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: Route 55 & Wheeler Road/Wheeler Rd



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	103	54	66	10	46	80	30	392	17	49	513	48
Satd. Flow (prot)	0	1747	0	0	1709	0	0	1848	0	0	1835	0
Flt Permitted		0.758			0.972			0.934			0.934	
Satd. Flow (perm)	0	1355	0	0	1668	0	0	1731	0	0	1721	0
Satd. Flow (RTOR)		23			79			4			9	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	243	0	0	148	0	0	477	0	0	663	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		1			1			5			5	
Permitted Phases	1			1			5			5		
Total Split (s)	30.0	30.0		30.0	30.0		60.0	60.0		60.0	60.0	
Total Lost Time (s)		5.0			5.0			5.0			5.0	
Act Effct Green (s)		25.0			25.0			55.0			55.0	
Actuated g/C Ratio		0.28			0.28			0.61			0.61	
v/c Ratio		0.62			0.28			0.45			0.63	
Control Delay		33.5			14.2			11.0			14.2	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		33.5			14.2			11.0			14.2	
LOS		C			B			B			B	
Approach Delay		33.5			14.3			11.0			14.2	
Approach LOS		C			B			B			B	
Queue Length 50th (ft)		109			30			131			214	
Queue Length 95th (ft)		191			78			201			325	
Internal Link Dist (ft)		846			419			539			621	
Turn Bay Length (ft)												
Base Capacity (vph)		393			520			1059			1055	
Starvation Cap Reductn		0			0			0			0	
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.62			0.28			0.45			0.63	

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 90
Offset: 42 (47%), Referenced to phase 6:, Start of Green
Control Type: Pretimed
Maximum v/c Ratio: 0.63
Intersection Signal Delay: 16.3 — Intersection LOS: B
Intersection Capacity Utilization 77.1% — ICU Level of Service D
Analysis Period (min) 15

Splits and Phases: 2: Route 22 & Pleasant Ridge Rd

Full Buildout Build w/o Improve PM
1: Route 55 & Wheeler Road/Wheeler Rd

9/3/2015

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	28	5	21	312	5	170	13	724	128	94	484	37
Satd. Flow (prot)	0	1718	0	0	1720	0	0	1824	0	0	1833	0
Flt Permitted		0.780			0.771			0.989			0.725	
Satd. Flow (perm)	0	1374	0	0	1369	0	0	1805	0	0	1340	0
Satd. Flow (RTOR)		23			48			21			8	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	58	0	0	529	0	0	940	0	0	668	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		1			1			5			5	
Permitted Phases	1			1			5			5		
Total Split (s)	25.0	25.0		25.0	25.0		35.0	35.0		35.0	35.0	
Total Lost Time (s)		5.0			5.0			5.0			5.0	
Act Effct Green (s)		20.0			20.0			30.0			30.0	
Actuated g/C Ratio		0.33			0.33			0.50			0.50	
v/c Ratio		0.12			1.08			1.03			0.99	
Control Delay		10.5			87.8			55.9			51.2	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		10.5			87.8			55.9			51.2	
LOS		B			F			E			D	
Approach Delay		10.5			87.8			55.9			51.2	
Approach LOS		B			F			E			D	
Queue Length 50th (ft)		9			~210			~342			219	
Queue Length 95th (ft)		30			#380			#581			#440	
Internal Link Dist (ft)		1394			1015			567			1804	
Turn Bay Length (ft)												
Base Capacity (vph)		473			488			913			674	
Starvation Cap Reductn		0			0			0			0	
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.12			1.08			1.03			0.99	

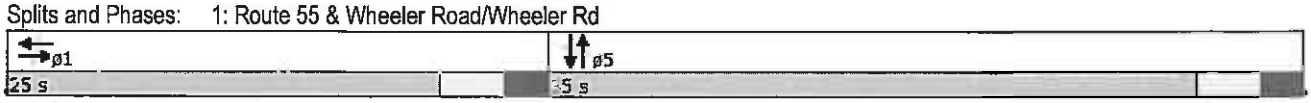
Intersection Summary

Cycle Length: 60
Actuated Cycle Length: 60
Offset: 29 (48%), Referenced to phase 6:, Start of Green
Control Type: Pretimed
Maximum v/c Ratio: 1.08
Intersection Signal Delay: 61.0 — Intersection LOS: E
Intersection Capacity Utilization 126.6% — ICU Level of Service H
Analysis Period (min) 15

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: Route 55 & Wheeler Road/Wheeler Rd



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	38	67	38	5	50	46	69	559	8	67	408	68
Satd. Flow (prot)	0	1772	0	0	1744	0	0	1850	0	0	1820	0
Flt Permitted		0.902			0.989			0.886			0.856	
Satd. Flow (perm)	0	1620	0	0	1728	0	0	1647	0	0	1567	0
Satd. Flow (RTOR)		20			47			1			15	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	155	0	0	109	0	0	692	0	0	590	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		1			1			5			5	
Permitted Phases	1			1			5			5		
Total Split (s)	30.0	30.0		30.0	30.0		60.0	60.0		60.0	60.0	
Total Lost Time (s)		5.0			5.0			5.0			5.0	
Act Effct Green (s)		25.0			25.0			55.0			55.0	
Actuated g/C Ratio		0.28			0.28			0.61			0.61	
v/c Ratio		0.33			0.21			0.69			0.61	
Control Delay		24.8			16.3			16.2			14.0	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		24.8			16.3			16.2			14.0	
LOS		C			B			B			B	
Approach Delay		24.8			16.3			16.2			14.0	
Approach LOS		C			B			B			B	
Queue Length 50th (ft)		60			26			240			185	
Queue Length 95th (ft)		115			67			371			290	
Internal Link Dist (ft)		846			419			539			621	
Turn Bay Length (ft)												
Base Capacity (vph)		464			513			1006			963	
Starvation Cap Reductn		0			0			0			0	
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.33			0.21			0.69			0.61	

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 90
Offset: 42 (47%), Referenced to phase 6 : Start of Green
Control Type: Pretimed
Maximum v/c Ratio: 0.69
Intersection Signal Delay: 16.2 — Intersection LOS: B
Intersection Capacity Utilization 66.3% — ICU Level of Service C
Analysis Period (min) 15

Splits and Phases: 2: Route 22 & Pleasant Ridge Rd

Full Buildout Build w/ Improve AM
1: Route 55 & Wheeler Road/Wheeler Rd

9/3/2015

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	30	0	21	82	6	53	17	480	268	150	753	49
Satd. Flow (prot)	0	1709	0	1770	1613	0	1770	1863	1583	1770	1846	0
Flt Permitted		0.848		0.720			0.133			0.357		
Satd. Flow (perm)	0	1493	0	1341	1613	0	248	1863	1583	665	1846	0
Satd. Flow (RTOR)		36			58				291		8	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	56	0	89	65	0	18	522	291	163	871	0
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	
Protected Phases		1			1			5			5	
Permitted Phases	1			1			5		5	5		
Total Split (s)	25.0	25.0		25.0	25.0		35.0	35.0	35.0	35.0	35.0	
Total Lost Time (s)		5.0		5.0	5.0		5.0	5.0	5.0	5.0	5.0	
Act Effct Green (s)		20.0		20.0	20.0		30.0	30.0	30.0	30.0	30.0	
Actuated g/C Ratio		0.33		0.33	0.33		0.50	0.50	0.50	0.50	0.50	
v/c Ratio		0.11		0.20	0.11		0.15	0.56	0.31	0.49	0.94	
Control Delay		8.1		15.8	5.9		11.6	13.3	2.2	16.3	35.0	
Queue Delay		0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay		8.1		15.8	5.9		11.6	13.3	2.2	16.3	35.0	
LOS		A		B	A		B	B	A	B	C	
Approach Delay		8.1			11.6			9.4			32.0	
Approach LOS		A			B			A			C	
Queue Length 50th (ft)		5		23	2		3	121	0	36	272	
Queue Length 95th (ft)		25		52	23		15	201	31	87	#516	
Internal Link Dist (ft)		1394			1015			567			420	
Turn Bay Length (ft)												
Base Capacity (vph)		521		447	576		124	931	937	332	927	
Starvation Cap Reductn		0		0	0		0	0	0	0	0	
Spillback Cap Reductn		0		0	0		0	0	0	0	0	
Storage Cap Reductn		0		0	0		0	0	0	0	0	
Reduced v/c Ratio		0.11		0.20	0.11		0.15	0.56	0.31	0.49	0.94	

Intersection Summary

Cycle Length: 60
Actuated Cycle Length: 60
Offset: 29 (48%), Referenced to phase 6:, Start of Green
Control Type: Pretimed
Maximum v/c Ratio: 0.94
Intersection Signal Delay: 20.8 — Intersection LOS: C
Intersection Capacity Utilization 68.0% — ICU Level of Service C
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: Route 55 & Wheeler Road/Wheeler Rd

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	103	54	66	10	46	80	30	392	17	49	513	48
Satd. Flow (prot)	0	1747	0	0	1709	0	0	1848	0	0	1835	0
Flt Permitted		0.758			0.972			0.934			0.934	
Satd. Flow (perm)	0	1355	0	0	1668	0	0	1731	0	0	1721	0
Satd. Flow (RTOR)		23			79			4			9	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	243	0	0	148	0	0	477	0	0	663	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		1			1			5			5	
Permitted Phases	1			1			5			5		
Total Split (s)	30.0	30.0		30.0	30.0		60.0	60.0		60.0	60.0	
Total Lost Time (s)		5.0			5.0			5.0			5.0	
Act Effct Green (s)		25.0			25.0			55.0			55.0	
Actuated g/C Ratio		0.28			0.28			0.61			0.61	
v/c Ratio		0.62			0.28			0.45			0.63	
Control Delay		33.5			14.2			11.0			14.2	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		33.5			14.2			11.0			14.2	
LOS		C			B			B			B	
Approach Delay		33.5			14.3			11.0			14.2	
Approach LOS		C			B			B			B	
Queue Length 50th (ft)		109			30			131			214	
Queue Length 95th (ft)		191			78			201			325	
Internal Link Dist (ft)		846			419			539			621	
Turn Bay Length (ft)												
Base Capacity (vph)		393			520			1059			1055	
Starvation Cap Reductn		0			0			0			0	
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.62			0.28			0.45			0.63	

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 90
Offset: 42 (47%), Referenced to phase 6:, Start of Green
Control Type: Pretimed
Maximum v/c Ratio: 0.63
Intersection Signal Delay: 16.3 Intersection LOS: B
Intersection Capacity Utilization 77.1% ICU Level of Service D
Analysis Period (min) 15

Splits and Phases: 2: Route 22 & Pleasant Ridge Rd

Full Buildout Build w/ Improve PM
1: Route 55 & Wheeler Road/Wheeler Rd

9/3/2015

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	28	5	21	312	5	170	13	724	128	94	484	37
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Satd. Flow (prot)	0	1718	0	1770	1591	0	1770	1863	1583	1770	1842	0
Flt Permitted		0.824		0.719			0.320			0.143		
Satd. Flow (perm)	0	1452	0	1339	1591	0	596	1863	1583	266	1842	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		23			137				139		9	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1474			1095			647			500	
Travel Time (s)		33.5			24.9			14.7			11.4	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	58	0	339	190	0	14	787	139	102	566	0
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	
Protected Phases		1			1			5			5	
Permitted Phases	1			1			5		5	5		
Total Split (s)	25.0	25.0		25.0	25.0		35.0	35.0	35.0	35.0	35.0	
Total Lost Time (s)		5.0		5.0	5.0		5.0	5.0	5.0	5.0	5.0	
Act Effct Green (s)		20.0		20.0	20.0		30.0	30.0	30.0	30.0	30.0	
Actuated g/C Ratio		0.33		0.33	0.33		0.50	0.50	0.50	0.50	0.50	
v/c Ratio		0.12		0.76	0.31		0.05	0.85	0.16	0.77	0.61	
Control Delay		10.4		31.7	6.8		8.3	24.2	2.3	54.4	14.2	
Queue Delay		0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay		10.4		31.7	6.8		8.3	24.2	2.3	54.4	14.2	
LOS		B		C	A		A	C	A	D	B	
Approach Delay		10.4			22.8			20.7			20.3	
Approach LOS		B			C			C			C	
Queue Length 50th (ft)		9		107	13		2	228	0	28	134	
Queue Length 95th (ft)		30		#229	52		10	#439	22	#110	223	
Internal Link Dist (ft)		1394			1015			567			420	
Turn Bay Length (ft)												
Base Capacity (vph)		499		446	621		298	931	861	133	925	
Starvation Cap Reductn		0		0	0		0	0	0	0	0	
Spillback Cap Reductn		0		0	0		0	0	0	0	0	
Storage Cap Reductn		0		0	0		0	0	0	0	0	
Reduced v/c Ratio		0.12		0.76	0.31		0.05	0.85	0.16	0.77	0.61	

Intersection Summary

Area Type: Other
Cycle Length: 60
Actuated Cycle Length: 60
Offset: 29 (48%), Referenced to phase 6:, Start of Green
Control Type: Pretimed
Maximum v/c Ratio: 0.85
Intersection Signal Delay: 20.8 Intersection LOS: C
Intersection Capacity Utilization 80.6% ICU Level of Service D
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: Route 55 & Wheeler Road/Wheeler Rd

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	38	67	38	5	50	46	69	559	8	67	408	68
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Satd. Flow (prot)	0	1772	0	0	1744	0	0	1850	0	0	1820	0
Flt Permitted		0.902			0.989			0.886			0.856	
Satd. Flow (perm)	0	1620	0	0	1728	0	0	1647	0	0	1567	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		20			47			1			15	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		926			499			619			701	
Travel Time (s)		21.0			11.3			14.1			15.9	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	155	0	0	109	0	0	692	0	0	590	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		1			1			5			5	
Permitted Phases	1			1			5			5		
Total Split (s)	30.0	30.0		30.0	30.0		60.0	60.0		60.0	60.0	
Total Lost Time (s)		5.0			5.0			5.0			5.0	
Act Effct Green (s)		25.0			25.0			55.0			55.0	
Actuated g/C Ratio		0.28			0.28			0.61			0.61	
v/c Ratio		0.33			0.21			0.69			0.61	
Control Delay		24.8			16.3			16.2			14.0	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		24.8			16.3			16.2			14.0	
LOS		C			B			B			B	
Approach Delay		24.8			16.3			16.2			14.0	
Approach LOS		C			B			B			B	
Queue Length 50th (ft)		60			26			240			185	
Queue Length 95th (ft)		115			67			371			290	
Internal Link Dist (ft)		846			419			539			621	
Turn Bay Length (ft)												
Base Capacity (vph)		464			513			1006			963	
Starvation Cap Reductn		0			0			0			0	
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.33			0.21			0.69			0.61	

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 42 (47%), Referenced to phase 6 , Start of Green
Control Type: Pretimed
Maximum v/c Ratio: 0.69
Intersection Signal Delay: 16.2 Intersection LOS: B
Intersection Capacity Utilization 66.3% ICU Level of Service C
Analysis Period (min) 15

Splits and Phases: 2: Route 22 & Pleasant Ridge Rd

APPENDIX D

Water and Wastewater Design Flow Calculations

Project	Olivet Center – Full Build	Project #	29273.00
Location	Dover, New York		
Calculated by	CJO	Date	8/31/15
Checked by	MWJ	Date	8/31/15
Title	Water and Wastewater Design Flow Calculations		

Description / Classification	Type of Use (NYSDEC)	Quantity	Unit	Gallons Per Day*	Total (gpd)
University Dormed Students (80%) / Dormed Student	School Boarding	2,000	Per Student	75	150,000
University Day Students (20%) / Day Student	School - Day	500	Per Student	20	10,000
University Staff (1 staff / 5 students) / Staff	Employee	500	Per Employee	15	7,500
Resident Staff Families / Staff	Employee	156	Per Employee	15	2,340
Partner Organization / Staff	Office Building	200	Per Employee	20	4,000
Day Care / Family Center	Day Care	75	Per Child	20	1,500
K-12 Primary School Students / Day Students	School - Day	210	Per Student	22	4,620
K-12 Primary School Staff / Staff	Employee	42	Per Employee	15	630
University Dormed Cafeteria	24- Hour Restaurant	588	Per Seat	50	29,400
				Total	209,990

**Numbers based upon Section B.6.b "Design Flows" found in the NYSDEC Design Standards for Intermediate Sized Wastewater Treatment Systems*

Assumptions:

1) Added additional flow for meals/showers for Day Students
2) Added additional flow for showers for Office Building Employees

Project: Olivet Center – Phase 1 Project #: 29273.00
Location: Dover, New York
Calculated by: CJO Date: 8/31/15
Checked by: MWJ Date: 8/31/15
Title: Water and Wastewater Design Flow Calculations

Description / Classification	Type of Use (NYSDEC)	Quantity	Unit	Gallons Per Day*	Total (gpd)
University Dormed Students (80%) / Dormed Student	School Boarding	105	Per Student	75	7,875
University Day Students (20%) / Day Student	School - Day	26	Per Student	20	520
University Staff (1 staff / 5 students) / Staff	Employee	50	Per Employee	15	750
Resident Staff Families / Staff	Employee	60	Per Employee	15	900
Partner Organization / Staff	Office Building	100	Per Employee	20	2,000
Day Care / Family Center	Day Care	20	Per Child	20	400
K-12 Primary School Students / Day Students	School - Day	20	Per Student	22	440
K-12 Primary School Staff / Staff	Employee	4	Per Employee	15	60
University Dormed Cafeteria	24- Hour Restaurant	588	Per Seat	50	29,400
				Total	42,345

**Numbers based upon Section B.6.b "Design Flows" found in the NYSDEC Design Standards for Intermediate Sized Wastewater Treatment Systems*

Assumptions:

1) Added additional flow for meals/showers for Day Students
2) Added additional flow for showers for Office Building Employees

APPENDIX E

Letter from Historical Perspectives Inc.

September 1, 2015

It is our understanding, as HPI continues to work on the celebration of the historic elements of HVPC, that the Olivet Center Project will embrace the HVPC built resources and the landscaped campus and introduce designs that require minimal visual and/or contextual alterations. These minimum building and campus adjustments include the following.

- The Olivet initiative does not rely on destruction of the HVPC complex as prior development concepts; HVPC and Olivet are a "fit." Olivet will transform the HVPC features into a future service that maximizes existing resources. Olivet's programs need dormitories, a chapel, recreational fields, family homes, business offices, and classrooms. HVPC provides these exact same components, as noted in the Phase I Site Plan.

  A simple comparison of the prior preservation plans by Dover Knolls with Olivet's emphasis on adaptive reuse and rebuilding-in-kind is instructive. Dover Knolls' plans for the east campus included preservation of only seven of the SR/NR-eligible buildings; Olivet's plans for the east campus include preservation and rebuilding-in-kind of twenty of the SR/NR-eligible buildings.

- Specific changes are required to the HVPC buildings due to the Fire Safety and Building Codes; these changes include windows, doors, elevators, ADA access ramps, etc. Olivet is performing Code Studies on the buildings to identify the minimum alterations necessary to meet regulations so that unnecessary damage to the original architectural fabric can be avoided. Based on the Liscum McCormack VanVoorhis LLP design plans (7/27/15), the intent is to retain the historic "look" of each of the buildings to the extent possible. The introduction of new windows and the access ramps is being handled with sensitivity; the size of openings is being maintained, as is the rhythm of the fenestration.

- The interior roads and parking lots must also be slightly re-configured to meet Town Code which dictates parking space counts for the various uses and corridors that meet the fire department minimum widths and radii. The HVPC never functioned as a fully trafficked, public campus and there is no question that additional asphalt coverage will be required. Olivet intends to celebrate the rural nature of the campus and only introduce the minimum required pavement.

- The landscaped campus and particularly the large caliper trees are recognized assets both from within the campus perspective and from the public vehicular traffic. Olivet's landscape plans include long overdue maintenance care of the existing tree cover and efforts to save all healthy specimens by working around the trees.

As the Olivet rehabilitation plans progress, HPI will assist with SHPO consultations to ensure cultural resource compliance with the SEQRA requirements. These state regulations will ensure that Olivet's thoughtful program of balancing preservation with adherence to current codes will not pose a significant adverse effect on the historic HVPC.

Sincerely,

Cece Saunders, President

P.O. Box 529 • Westport • Connecticut • 06881
203-226-7654 / www.historicalperspectives.org

APPENDIX F

Phase I Environmental Assessment by EBI Consulting

September 3, 2013

Phase I Environmental Site Assessment

Harlem Valley Psychiatric Center

73 Wheeler Road
Wingdale, New York

EBI Project No. 12130171

September 5, 2013

Prepared for:

Silver Arch Capital Partners, LLC
Continental Plaza
433 Hackensack Avenue, 12th Floor
Hackensack, NJ 07601

Prepared by:

EBI Consulting
environmental | engineering | due diligence

EBI Consulting
environmental | engineering | due diligence

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September 5, 2013

Mr. Matt Cole
Silver Arch Capital Partners, LLC
Continental Plaza
433 Hackensack Avenue, 12th Floor
Hackensack, NJ 07601

Subject: Phase I Environmental Site Assessment
Harlem Valley Psychiatric Center
73 Wheeler Road, Wingdale, New York
EBI Project No. 12130171

Dear Mr. Cole:

Attached please find our *Phase I Environmental Site Assessment* (the report) for the above-mentioned asset (the Subject Property). During the survey and research, our surveyor met with agents representing the Subject Property, or agents of the owner, and reviewed the Subject Property and its history. The report was completed according to the terms and conditions authorized by you. This report has been completed in general conformance with the ASTM Standard E 1527-

This report is addressed to *Silver Arch Capital Partners, LLC* and such other persons as may be designated by *Silver Arch Capital Partners, LLC* and their respective successors and assigns. Reliance on the report and the information contained herein shall mean (i) the report may be relied upon by *Silver Arch Capital Partners, LLC* in determining whether to make a loan evidenced by a note secured by the Subject Property ("the Mortgage Loan"); (ii) the report may be relied upon by any loan purchaser in determining whether to purchase the Mortgage Loan from *Silver Arch Capital Partners, LLC*, or an interest in the Mortgage Loan or securities backed or secured by the Mortgage Loan, and any rating agency rating securities representing an interest in the Mortgage Loan or backed or secured by the Mortgage Loan; (iii) the report may be referred to in and included, in whole or in part, with materials offering for sale the Mortgage Loan or an interest in the Mortgage Loan or securities backed or secured by the Mortgage Loan; (iv) the report speaks only as of its date in the absence of a specific written update of the report signed and delivered by EBI Consulting.

There are no intended or unintended third party beneficiaries to this report, except as expressly stated herein.

EBI is an independent contractor, not an employee of either the issuer or the borrower, and its compensation was not based on the findings or recommendations made in the report or on the closing of any business transaction.

We declare that, to the best of our professional knowledge and belief, we meet the definition of Environmental Professional as defined in §312.10 of 40 CFR 312 and we have the specific qualifications based on education, training, and experience to assess a property of the nature, history, and setting of the Subject Property. We have developed and performed the all appropriate inquiries in conformance with the standards and practices set forth in 40 CFR Part 312.

Thank you very much for the opportunity to provide environmental consulting services to *Silver Arch Capital Partners, LLC*. Should you have any questions or require additional information, please do contact the undersigned.

Respectfully submitted,
EBI CONSULTING

Madeline Soule Author/Environmental Scientist	Brian White Senior Scientist	Josh Simon Managing Director

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EXECUTIVE SUMMARY

At the request of Silver Arch Capital Partners, LLC, EBI has performed a Phase I Environmental Site Assessment (ESA) of the property located at 73 Wheeler Road in Wingdale, New York, herein referred to as the Subject Property. The main objective of this ESA was to identify *recognized environmental conditions* in connection with the Subject Property, defined in ASTM Practice E 1527-05 as the presence or likely presence of any hazardous substances or petroleum products that indicate an existing release, a past release, or a material threat of a release. This ESA also includes a preliminary evaluation of certain potential environmental conditions that are outside the scope of ASTM Practice E 1527-05.

The Subject Property is currently improved with the former Harlem Valley Psychiatric Center (HVPC), a psychiatric center operated by the New York State Office of Mental Health (OMH), which operated at the site between 1924 and 1994. During operation of HVPC, the site operated as a self sustained campus including power generation provided by a coal-fired Power Plant, potable water provided by the on-site reservoir with treatment at the water treatment plant, sanitary sewage treatment, and food production via field farming and livestock practices. Hospital buildings included a medical-surgical building as well as numerous patients' buildings, continued treatment buildings, administrative buildings, staff housing buildings, and community infrastructure related buildings.

At the time of the assessment the Subject Property was mainly unoccupied, with the exception of several buildings and areas being utilized by Olivet Management, as well as one tenant.

Below is the Assessment Summary Table presenting our recommended actions for the Subject Property. EBI's Findings and Opinions are presented in Section 8.0, and recommendations for further action or investigation are presented in Section 9.0.

ASSESSMENT SUMMARY TABLE			
Assessment Component	**Section(s)**	**Recommended Actions**	**Estimated Cost**
Historical Review	4.3	EBI recommends that a limited subsurface investigation be conducted in the vicinity of each the identified dump/landfill sites to further document and delineate impacts from historic operations. In addition, EBI recommends sampling the monitoring wells located in the vicinity of Building 34.	$30,000
Current Occupants / Operations	2.3, 5.0	No Further Action	
Hazardous Substances / Petroleum Products	5.2	EBI recommends the contents of various sized containers ranging from aerosol containers to 55-gallon drums of oil and hazardous materials located throughout the Subject Property be properly characterized and disposed of.	Action Item
Waste Generation	5.3	No Further Action	
Storage Tanks	5.4	EBI recommends that a limited subsurface investigation be conducted in the vicinity of each the identified existing underground storage tanks (USTs)	Included in above cost
PCBs	5.5	No Further Action	
Potential Off-site Sources	2.5, 4.1	No Further Action	
Regulatory Agency / Database Review	4.1	EBI recommends consultation with the NYSDEC if proposed redevelopment activities include Building 34 and the former ash landfill area located west and northwest of Building 34.	Action Item
Asbestos Containing Materials	7.1	An asbestos survey should be performed prior to any renovation or demolition at the Subject Property	Action Item
Radon	7.2	Previous investigations identified elevated concentrations of radon at the Subject Property. Additional sampling and/or mitigation may be required should these buildings be occupied in the future	Action Item
Lead-Based Paint	7.3	A lead-based paint survey should be performed prior to any renovation or demolition at the Subject Property	Action Item
Lead in Drinking Water	7.4	No Further Action	

1.0 INTRODUCTION

This report documents the findings, opinions, and conclusions of a Phase I Environmental Site Assessment (ESA) of the property located at 73 Wheeler Road in Wingdale, New York.

1.1 PURPOSE

The purpose of this ESA was to identify *recognized environmental conditions* and certain environmental conditions outside the scope of ASTM Practice E 1527-05 in connection with the property at the time of the property reconnaissance.

1.2 SCOPE-OF-SERVICES

This ESA was conducted utilizing a standard of good commercial and customary practice that was consistent with the ASTM Practice E 1527-05. Any significant scope-of-work additions, deletions or deviations to ASTM Practice E 1527-05 are noted below or in the corresponding sections of this report. The scope-of-work for this assessment included an evaluation of the following:

- Physical characteristics of the Subject Property through a review of referenced sources for topographic, geologic, soils and hydrologic data.
- Subject Property history through a review of referenced sources such as land deeds, fire insurance maps, city directories, aerial photographs, prior reports, and interviews.
- Current Subject Property conditions, including observations and interviews regarding the following: the presence or absence of hazardous substances or petroleum products; generation, treatment, storage, or disposal of hazardous, regulated, or biomedical waste; equipment that utilizes oils which potentially contain PCBs; and storage tanks (aboveground and underground).
- Usage of surrounding area properties and the likelihood for releases of hazardous substances and petroleum products (if known and/or suspected) to migrate onto the Subject Property.
- Information in referenced environmental agency databases and local environmental records, within specified minimum search distances.
- Past ownership through a review of available prior reports and local municipal file review.

The scope-of-work also included consideration of the following potential environmental conditions that are outside the scope of ASTM Practice E 1527-05: asbestos-containing materials (ACM), lead-based paint (LBP), lead in drinking water, and radon.

1.3 ASSUMPTIONS, LIMITATIONS AND EXCEPTIONS

This Phase I Environmental Site Assessment (the report) has been prepared for the use of Silver Arch Capital Partners, LLC, in accordance with our Standard Conditions for Engagement and Authorization Letter and Agreement for Environmental Services approved and signed by Silver Arch Capital Partners, LLC, and with the limitations described below, all of which are integral parts of this report. A copy of the signed Standard Conditions For Engagement and Authorization Letter and Agreement for Environmental Services is maintained at the EBI Consulting office in Burlington, Massachusetts.

EBI has performed this Phase I Environmental Site Assessment in conformance with the scope and limitations of *ASTM Standard E 1527-05, Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process*. This report was prepared with no exceptions or deletions from ASTM Standard E 1527-05.

This Phase I Environmental Site Assessment has been prepared to assess a parcel of commercial real estate with respect to the range of contaminants within the scope of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) (42 U.S.C. §9601) and petroleum products. As such, this practice is intended to permit Silver Arch Capital Partners, LLC to satisfy one of the requirements to qualify for the innocent landowner, contiguous property owner, or bona fide prospective purchaser limitations on CERCLA liability: that is, the practices that constitute "all appropriate inquiry into the previous ownership and uses of the Subject Property consistent with good commercial or customary practice" as defined in 42 U.S.C. § 9601(35)(B).

In defining a standard of good commercial and customary practice for conducting an environmental site assessment of a parcel of property, the goal of the processes established by this practice is to identify *recognized environmental conditions*. The term recognized environmental conditions means the presence or likely presence of any hazardous substances or petroleum products on a property under conditions that indicate an existing release, a past release, or a material threat of a release of any hazardous substances or petroleum products into structures on the property or into the ground, ground water, or surface water of the property. The term includes hazardous substances or petroleum products even under conditions in compliance with laws. The term is not intended to include *de minimis conditions* that generally do not present a threat to human health or the environment and that generally would not be the subject of an enforcement action if brought to the attention of appropriate governmental agencies. Conditions determined to be de minimis are not recognized environmental conditions.

The information reported was obtained through sources deemed reasonably ascertainable, as defined in ASTM Standard E 1527-05; a visual site survey of areas readily observable, easily accessible or made accessible by the Subject Property contact and interviews with owners, agents, occupants, or other appropriate persons involved with the Subject Property. Municipal information was obtained through review of reasonably ascertainable standard government record sources and interviews with the authorities having jurisdiction over the Subject Property. Findings, conclusions, and recommendations included in the report are based on our visual observations in the field, the municipal information reasonably obtained, information provided by the Client, and/or a review of readily available and supplied documents and drawings. EBI relies completely on the information, whether written, graphic, or verbal, provided by the Subject Property contact or as shown on any documents reviewed or received from the Subject Property contact, owner or agent, or municipal source, and assumes that information to be true and correct. Although there may have been some degree of overlap in the information provided by these various sources, EBI did not attempt to independently verify the accuracy or completeness of all information reviewed or received during the course of these environmental services.

The observations in this report are valid on the date of the investigation. Where access to portions of the Subject Property or to structures on the Subject Property was unavailable or limited, EBI renders no opinion as to the presence of hazardous substances or petroleum products in that portion of the Subject Property or structure. Inaccessible portions of the Subject Property are described below. In addition, EBI renders no opinion as to the presence of, or indirect evidence relating to, hazardous substances or petroleum products where direct observation of the interior walls, floor, or ceiling of a structure was obstructed by objects or coverings on or over these surfaces.

It is acknowledged that EBI judgments shall not be based on scientific or technical tests or procedures beyond the scope of the Services or beyond the time and budgetary constraints imposed by the Client. It is acknowledged further that EBI conclusions shall not rest on pure science but on such considerations as economic feasibility and available alternatives. Client also acknowledges that, because geologic and soil formations are inherently random, variable, and indeterminate in nature, the Services and opinions provided under this Agreement with respect to such Services are not guaranteed to be a representation of actual conditions on the Subject Property, which are also subject to change with time as a result of natural or man-made processes, including water permeation. In performing the Services, EBI shall use that degree of care and skill ordinarily exercised by environmental consultants or engineers performing similar services in the same or similar locality. The standard of care shall be determined solely at the time the Services are rendered and not according to standards utilized at a later date. The Services shall be rendered without any other warranty, expressed or implied, including, without limitation, the warranty of merchantability and the warranty of fitness for a particular purpose.

Client and EBI agree that to the fullest extent permitted by law, EBI shall not be liable to Client for any special, indirect or consequential damages whatsoever, whether caused by EBI's negligence, errors, omissions, strict liability, breach of contract, breach of warranty or other cause or causes whatsoever.

The ASTM Standard E 1527-05 does not encompass analytical testing to evaluate asbestos containing materials, radon, lead-based paint, drinking water quality, indoor air quality, stored chemicals, debris, fill materials, surface water, or subsurface samples (soil and groundwater) as part of a Phase I ESA. Any analytical testing performed at the Subject Property has been conducted in accordance with the Standard Conditions for Engagement and Authorization Letter and Agreement for Environmental Services and the client-specific Scope of Work. Unless otherwise specified herein, such testing involves screening methods intended to provide a broad and approximate evaluation of conditions at readily accessible portions of the Subject Property, limited by project constraints, and should not be construed as a comprehensive program designed to comply with a specific regulatory program. If a thorough and regulatory-compliant study is warranted based on the findings of the Phase I ESA, EBI will recommend the appropriate further investigation. In certain cases, quantitative laboratory testing is performed as part of the assessment and analyses have been conducted by an outside laboratory. EBI relies upon the data provided by the outside laboratory, and has not conducted an independent evaluation of the reliability of this data.

The assessment was conducted in a manner consistent with the level of care and skill ordinarily exercised by members of the profession, and in accordance with generally accepted practices of other consultants currently practicing in the same locality under similar conditions. No other representation, expressed or implied, and no warranty or guarantee is included or intended. The report speaks only as of its date, in the absence of a specific written update of the report, signed and delivered by EBI.

Additional information that becomes available after our survey and draft submission concerning the Subject Property should be provided to EBI so that our conclusions may be revised and modified if necessary, at additional cost. This report has been prepared in accordance with our Standard Conditions for Engagement, which is an integral part of this report.

1.4 SPECIAL TERMS AND CONDITIONS

This Phase I Environmental Site Assessment (the report) has been prepared to assist Silver Arch Capital Partners, LLC in its underwriting of a proposed mortgage loan on the Subject Property. This report can be relied upon by only the parties stated in the transmittal letter at the front of this report. EBI's liability to a purchaser wishing to use this report is limited to the cost of the report. Amendments to EBI's limitations as stated herein that may occur after issuance of the report are considered to be included in this report. Payment for the report is made by, and EBI's contract and report extends to Silver Arch Capital Partners, LLC only, in accordance with our Standard Conditions For Engagement and, Authorization Letter and Agreement for Environmental Services.

1.5 DATA GAPS

Any data gaps identified herein, as defined by ASTM Practice E 1527-05 § 3.2.20, are not considered to have significantly affected the ability to identify recognized environmental conditions in connection with the Subject Property and do not alter the conclusions of this report, except for the following:

EBI identified 17 Spills and 6 LTANKS listings at the Subject Property indicating previous issues with oil and/or hazardous materials releases and leaking or potentially leaking tanks at the property. Each of these 23 listings is listed with a status of closed with the NYSDEC, each with the applicable closure date. However, EBI was unable to obtain closure reports or documentation including sampling or remediation actions for each of the spills. The lack of closure documentation for each of the Spills sites represents a significant data gap.

2.0 SUBJECT PROPERTY DESCRIPTION

2.1 OWNERSHIP AND LOCATION

According to the Dutchess County Assessor's Office and Ms. Kathleen Schibanoff, the Subject Property is currently owned by in part by Dover Knolls Development Co LLP and in part by Olivet Management LLC.

The Subject Property is located at 73 Wheeler Road in Wingdale hamlet, Town of Dover, Dutchess County, New York. The Subject Property includes four (4) contiguous irregular-shaped parcels, identified by the Wingdale, New York Assessor's Office as Parcel Grid Identification #s: 132600-7159-00-162702, 132600-7159-00-502949, 132600-7159-00-814768, 132600-7159-00-555750, cumulatively totaling approximately 936.95 acres. The Subject Property is located on the eastern and western side of Route 22, to the south of the split of Route 22 and Route 55. Figure 1 - Location Map depicts the location of the Subject Property on a street map of Wingdale, New York. Figure 2 - Locus Map depicts the location of the Subject Property on the Dover Plains, New York United States Geological Survey (USGS) 7.5 Minute Topographic Quadrangle. Figure 3 - Site Plan depicts the configuration of the Subject Property and adjoining properties.

2.2 SUBJECT PROPERTY IMPROVEMENTS

The Subject Property is currently improved with the former Harlem Valley Psychiatric Center (HVPC), a psychiatric center operated by the New York State Office of Mental Health (OMH), which operated at the site between 1924 and 1994. During operation of HVPC, the site operated as a self sustained campus including power generation provided by a coal-fired Power Plant, potable water provided by the on-site reservoir with treatment at the water treatment plant, sanitary sewage treatment, and food production via field farming and livestock raising. Hospital buildings included a medical-surgical building as well as numerous patients' buildings, continued treatment buildings, administrative buildings, staff housing buildings and community infrastructure related buildings. See below for the full list of buildings and structures on the Subject Property.

SUBJECT PROPERTY IMPROVEMENTS						
Bldg. No.	**Building Name**	**Street Address**	**DOC**	**Gross Square Footage**	**Floors**	**Basement**
1	Patient's Reception Building	Portchester Way	1931	64,964	3	Y
2	Kitchen and Dining Room Building "C"	Hutchinson Avenue	1930	25,024	1	Y
3	Patient's Building "B"	Hutchinson Avenue	1924	69,025	3	Y
5a	DFY Power Plant	Hutchinson Avenue	1994	4,200	1	N
7	Staff Home	Carmel Lane	1927	3,240	2	Y
8	Staff Home	Carmel Lane	1927	3,240	2	Y
9	Staff Home	Carmel Lane	1927	3,240	2	Y
10	Safety, Firehouse	Dover Lane	1918	17,378	1+	N
11	DFY	Hutchinson Avenue	1926	20,830	2	Y
12	DFY Administration Building	Hutchinson Avenue	1930	20,458	3	Y
13	5 Family Staff House	Carmel Lane	1928	5,396	2+	Y
14	School of Nursing (P)	Hutchinson Avenue	1927	25,752	2	Y
15	Baseball Grandstand	Wheeler Road	1932	3,500	1	N
15 a & b	Baseball dugouts	Wheeler Road	1932	500	1	N

17	Patient's Building "A"	Hutchinson Avenue	1924	51,296	3	Y
18	Staff Apartments, Employee Daycare	Putnam Lane	1934	16,282	2	Y
19	DFY Staff Housing, - I-Shaped Bldg.	1552 Route 22	1932	35,996	3	Y
20	DFY Staff Housing, - I-Shaped Bldg.	1552 Route 22	1932	35,996	3	Y
21	Beers Rehab Ctr., U- Shaped Bldg.	Wheeler Road	1933	50,935	3	Y
22	Storehouse, Bakery, and Laundry Building	Wheeler Road	1934	111,515	2	Y
23	Ross Administrative Building	Brewster Drive	1933	23,853	2	Y
24	Kitchen and Dining Room Building	Patterson Road	1934	73,174	1	Y
25	Continued Treatment Building (Female)	Mount Kisco Road	1934	137,100	3	Y
26	Continued Treatment Building (Male)	Patterson Road	1934	137,100	3	Y
27	Continued Treatment Building (Male)	Brewster Drive	1934	137,100	3	Y
28	Continued Treatment Building (Female)	Brewster Drive	1934	137,100	3	Y
29	Parole Patient's Building	White Plains Road	1933	29,294	3	Y
30	DOC Housing	White Plains Road	1933	29,294	3	Y
31	DOC Housing	Dutchess Court	1933	29,294	3	Y
32	DOC Housing	Dutchess Court	1933	29,294	3	Y
33	5 Family Staff House	Carmel Lane	1932	10,924	2	Y
34	Powerhouse, Maintenance, and Garage	Wheeler Road	1933	49,618	2+	N
35	Assembly Hall (Smith Hall)	Hutchinson Avenue	1938	49,106	2+	Y
36	Staff Home	Hutchinson Avenue	1890	3,160	2	Y
37	Staff Home	Hutchinson Avenue	1928	3,210	2	Y
38	Staff Home	Hutchinson Avenue	1890	5,540	2	Y
39	Director's House, now Manor House	73 Wheeler Road	1932	6,770	2	Y
43	Refreshment Stand	Wheeler Road	1965	660	1	N
45	Storage Garage	New Rochelle Road	1928	450	1	N
46	Staff Home	Hutchinson Avenue	1890	5,040	2	Y
47	Staff Garage	Hutchinson Avenue	1934	640	1	N
51	Farm Office	Wheeler Road	1900	900	1+	Unk
53	Staff Home	Wheeler Road	1900	5,860	2	Y
54	Staff Home	Wheeler Road	1900	2,080	2	Unk
55	Dairy Barn	Wheeler Road	1932	6,430	1	N
56	Milk House	Wheeler Road	1933	2,510	1	N
57	Root Cellar	Wheeler Road	1932	2,480	1	N
59	Pump House - Water System	Clover Lane	1932	1,280	1	N
60	Golf Clubhouse	109 Wheeler Road	1939	1,350	1	N
61 a&b	Tool Shed	Clover Lane	1935	675	1	N
62	Digester Building - Sewer System	Clover Lane	1932	288	1	N
63	Meter House - Sewer System	151 Wheeler Road			1	N

64	Disposal Beds - Pump - Sewer System	Clover Lane	1935	1,810	NA	NA
65	Disposal Beds - Sludge - Sewer System	Clover Lane	1932	8,970	NA	NA
66	Disposal Beds - Storage - Sewer System	Clover Lane	1935	437	NA	NA
67	Greenhouse	Hutchinson Avenue	1931	5,300	1	Unk
68	Staff Home	Hutchinson Avenue	1900	3,460	2	Unk
69	Staff Garage	Hutchinson Avenue	1939	300	1	N
70	Filter House - Water System	46 Portchester Way	1932	2,590	1+	N
71	1 Million Gallon Clear Well	Portchester Way	Unk	Unk	NA	NA
72	Aerator - Water System	Portchester Way	Unk	Unk	NA	NA
73	Water Tank - Water System	Portchester Way	Unk	Unk	NA	NA
77	Pump House - Water System	Portchester Way	Unk	Unk	1	N
79	Guard Shack	Wheeler Road	1949	219	1	N
80	Storage Garage	Clover Lane	1970	900	1	N
81	Storage Barn	Wheeler Road	1954	2450	1	N
85	Sullivan Tower - Medical Surgical	New Rochelle Road	1964	211,012	11	Y
91	Staff House	Hutchinson Avenue	1953	2,178	2	Y
92	Staff House	Hutchinson Avenue	1953	2,178	3	Y
93	Staff House	Hutchinson Avenue	1953	2,399	4	Y
94	Staff House	Hutchinson Avenue	1967	1,200	Unk	Unk
95	Staff House	Hutchinson Avenue	1968	1,200	Unk	Unk
96	Shed - Picnic Grove	Clover Lane	Unk	Unk	1	N
97	Pavilion - Picnic Grove	Clover Lane	Unk	Unk	NA	NA
99	Storage Shed	New Rochelle Road	Unk	80	1	N
103	Storage Barn		1954	4700	1	N
107	Catholic Chapel	181 Hutchinson Ave	1962	29,220		
109	Blower House - Sewer System	Clover Lane	1957	384	1	N

SF: Gross Square Feet
DOC: Date of Construction
Unk: Unknown

2.3 CURRENT USE OF THE SUBJECT PROPERTY

At the time of the assessment the Subject Property was mainly unoccupied, with the exception of several buildings and areas being utilized by Olivet Management, as well as one tenant. Below is a summary of the buildings that are currently in use. Buildings not listed are currently vacant.

CURRENT OCCUPANTS AND OPERATIONS			
Occupant	**Location**	**Operations**	**Notable Hazardous Substances / Petroleum Products Identified**
Olivet Management	Building 39 (Manor House)	Office	#2 Fuel oil
	Building 70, Water treatment structures 71, 72 and 73	Water treatment operations	Water treatment chemicals including potassium permanganate, chlorine compounds, organic flocculant

CURRENT OCCUPANTS AND OPERATIONS			
Occupant	**Location**	**Operations**	**Notable Hazardous Substances / Petroleum Products Identified**
			Laboratory chemicals
	Buildings 62-66 and 109	Wastewater treatment	#2 Fuel oil, chlorine, various cleaning products
Harlem Valley Golf Association	Golf Course Buildings 60 and 61 a & b	Golf course, club house and maintenance garages	#2 Fuel oil utilized for heat
			Gasoline, Diesel for vehicle fuel
			Various motor oils for vehicle maintenance
			Herbicides and pesticides and lawn maintenance chemicals

Please refer to Section 5.2 for further discussion regarding hazardous substances and petroleum products at the Subject Property.

2.4 MUNICIPAL SERVICES & UTILITIES

The Subject Property is serviced by the following municipal services and utilities:

MUNICIPAL SERVICES AND UTILITIES	
Utility	**Provider/Source**
Potable Water Supply	On-site reservoir
Sewage Disposal System	On-site treatment system discharging to Swamp River
Electrical Service	New York State Electric and Gas (NYSEG)
Natural Gas Service	Not provided
Oil Service	Taylor Oil
Heating/Cooling Systems	The majority of the Harlem Valley Psychiatric Center was formerly heated by low-pressure steam generated at the on-site coal-fired Power Plant. Additional oil-burning boilers were also utilized in select buildings. These systems were fueled by underground and aboveground storage tanks located throughout the site. See Section 5.2 for listings of former and existing underground and aboveground storage tanks at the Subject Property.
Emergency Power	Emergency power was formerly provided by fuel oil-burning emergency generators located at several of the building.

2.5 ADJOINING PROPERTIES

Property use in the vicinity of the Subject Property is primarily characterized by residential and retail/commercial development, as well as agricultural and undeveloped, wooded land.

ADJOINING PROPERTIES	
North	The Subject Property is bound to the north by residences along Pleasant Ridge Road, as well as a trucking yard and restaurant (Cousin's Café) along Route 22 and 55. To the north of the eastern portion of the property is the JH Ketcham Hose Co. Volunteer Fire House as well as a recreational park along Route 55.

ADJOINING PROPERTIES	
South	The Subject Property is bound to the south by undeveloped wooded land, as well as residences including modular homes along Wingdale Village Court, and houses along Route 22 and 55, Old Pawling Road, Hutchinson Ave, Johnson Road, and various side streets off Johnson Road. Additionally, Wingdale Mart gas station is located adjacent to the south of the Subject Property at 1551 Route 22.
East	The Subject Property is bound to the east by undeveloped, wooded land including a portion of the Appalachian Trail.
West	The Subject Property is bound to the west by residences and agricultural land along Old Pawling Road.

No visual evidence of adverse environmental conditions was observed during the survey of the adjoining properties.

3.0 User Provided Information

The following section summarizes information provided by Silver Arch Capital Partners, LLC with regard to this Phase I Environmental Site Assessment. Additionally, a User Questionnaire was forwarded to the designated Client contact. The User Questionnaire has not been completed and returned to our offices. The information requested in the User Questionnaire is intended to assist in gathering information that may be material to identifying recognized environmental conditions in connection with the Subject Property. Relevant documentation referenced below is presented in Appendix C.

3.1 Title Records

Title record information associated with the Subject Property has not been provided to EBI by Silver Arch Capital Partners, LLC. A detailed discussion regarding review of information obtained from other sources is presented in Section 4.3.5 of this report.

3.2 Environmental Liens and Activity and Use Limitations

Silver Arch Capital Partners, LLC has provided no information regarding environmental liens or activity and use limitations in connection with the Subject Property. A detailed discussion regarding environmental liens is presented in Section 4.3.7 of this report. A detailed discussion regarding activity and use limitations is presented in Sections 4.1.1 and 4.1.2 of this report.

3.3 Specialized Knowledge

Silver Arch Capital Partners, LLC provided no specialized knowledge that is material to recognized environmental conditions in connection with the Subject Property. EBI was not provided with or made aware of previous environmental assessments or other documentation that is material to recognized environmental conditions in connection with the Subject Property, except as presented in Section 4.3.8 of this report.

3.4 Commonly Known or Reasonably Ascertainable Information

Silver Arch Capital Partners, LLC has provided no commonly known or reasonably ascertainable information within the local community about the Subject Property that is material to recognized environmental conditions in connection with the Subject Property.

3.5 Valuation Reduction for Environmental Issues

Silver Arch Capital Partners, LLC has provided no information regarding valuation reduction for environmental issues in connection with the Subject Property.

3.6 Owner, Property Manager, and Occupant Information

Silver Arch Capital Partners, LLC provided contact information for the Subject Property owner, manager and/or occupants.

3.7 Reason for Performing Phase I ESA

Silver Arch Capital Partners, LLC retained EBI to complete this Phase I Environmental Site Assessment in connection with a real estate transaction.

4.0 RECORDS REVIEW

4.1 STANDARD ENVIRONMENTAL RECORDS

A review of standard environmental databases maintained by Federal, state, and tribal offices was completed through Environmental Data Resources, Inc. (EDR) of Milford, Connecticut. The databases were searched for properties with reported environmental conditions located within approximate minimum search distances as specified by ASTM Standard E 1527-05, by using geocoding information that identified the coordinates of the properties in the databases or by checking the street addresses of practically reviewable non-geocoded "orphan" properties within the same zip code. The database report is presented in Appendix E.

The database report identified 39 "orphan sites." Orphan sites are those sites that could not be accurately mapped or geocoded due to inadequate location information. EBI attempted to locate these sites via vehicular reconnaissance and interviews with personnel familiar with the area. Based on this research, EBI did not identify listed orphan sites within the approximate minimum search distances that may be considered likely to have impacted conditions at the Subject Property.

It should be noted that plotted locations of listed sites are not always accurate. With regard to listings that are determined or suspected to be inaccurate, based on information from other sources such as direct observation or consultation with individuals familiar with the property, EBI uses the best available data when evaluating the location of listed sites discussed below.

The following table provides a summary of the findings of the environmental database report. Specific properties identified within the database report are further discussed below.

SUMMARY OF FEDERAL, STATE, AND TRIBAL AGENCY DATABASE FINDINGS			
Regulatory Database	**Approximate Minimum Search Distance**	**Subject Property Listed**	**Off-site Listings Within Search Distance**
Federal NPL Sites	1.0 mile	No	0
Federal Delisted NPL Sites	0.5 mile	No	0
Federal CERCLIS Sites	0.5 mile	No	0
Federal CERCLIS NFRAP Sites	0.5 mile	**Yes (1)**	0
Federal RCRA CORRACTS Sites	1.0 mile	No	0
Federal RCRA non-CORRACTS TSD Sites	0.5 mile	No	0
Federal RCRA Generators Sites	Property & Adjoining	No	0
Federal Engineering / Institutional Control Sites	0.5 mile	No	0
Federal ERNS Sites	Property	No	NA
Federal RCRA Non-Generators Sites	Property	**Yes (1)**	NA
State and Tribal equivalent NPL / CERCLIS Sites	1.0 / 0.5 mile	No	0
State and Tribal Spills Sites	Property	**Yes (17)**	NA
State and Tribal Landfill or Solid Waste Disposal Sites	0.5 mile	No	**1**
State and Tribal Leaking Storage Tank Sites	0.5 mile	**Yes (6)**	**5**
State and Tribal Registered Storage Tank Sites	Property & Adjoining	**Yes (2)**	**1**
State and Tribal Engineering / Institutional Control Sites	0.5 mile	No	0
State and Tribal Voluntary Cleanup Sites	0.5 mile	No	0
State and Tribal Brownfield Sites	0.5 mile	No	0
New York Delisted SHWS	Property	**Yes (1)**	NA

4.1.1 Federal Agency Database Records

National Priority List (NPL)
The NPL database, also known as the Superfund List, is a subset of CERCLIS and identifies sites that are ranked as high priority for remedial action under the Federal Superfund Act. Neither the Subject Property nor any sites located within 1.0 mile of the Subject Property were identified on the NPL.

Delisted National Priority List (NPL)
The National Oil and Hazardous Substances Pollution Contingency Plan (NCP) establishes criteria that the EPA uses to delete sites from the NPL. In accordance with 40 CFR 300.425(e), sites may be deleted from the NPL where no further response is appropriate. Neither the Subject Property nor any sites located within 0.5 mile of the Subject Property were identified on the Delisted NPL database.

Comprehensive Environmental Response, Compensation and Liability Information System (CERCLIS)
CERCLIS contains data regarding potentially hazardous waste sites that have been reported to the USEPA by states, municipalities, private companies, and private persons, pursuant to Section 103 of the Comprehensive Environmental Response, Compensation and Liability ACT (CERCLA). CERCLIS contains sites that are included on the National Priority List (NPL), as well as sites which are in the screening and assessment phase for possible inclusion on the NPL. Neither the Subject Property nor any sites located within 0.5 mile of the Subject Property were identified on the CERCLIS database.

CERCLIS – No Further Remedial Action Planned (CERCLIS-NFRAP)
As of February 1995, CERCLIS sites designated as No Further Remedial Action Planned (NFRAP) have been removed from the CERCLIS list. NFRAP sites may be sites where, following an initial investigation, no contamination was found, contamination was removed without the need for the site to be placed on the NPL, or the contamination was not considered sufficient to warrant Federal Superfund action or NPL consideration. The Subject Property was identified on the CERCLIS-NFRAP database. Information about the listing is presented in the following table and described below:

CERCLIS-NFRAP			
Site	**Distance / Direction / Gradient***	**EPA ID No.**	**Regulatory Status**
Harlem Valley Psychiatric Center Rte 22 Wingdale, NY 12594	Subject Property	NYD980534424	Discovery: 04/01/80 Hazard Ranking System Package: 06/27/91 Preliminary Assessment Completed: 11/05/87 Site Inspection: 06/27/91 Archive Site: 01/23/96 Status: NFRAP

* Presumed hydrogeologic gradient based upon regional topography

According to the CERCLIS-NFRAP listing, the Subject Property was listed with a discovery date of April 1, 1980. A preliminary assessment completed November 5, 1987 indicated that the site was placed on the NFRAP listing, indicating "Site does not qualify for the NPL based on existing information." The site was archived on January 23, 1996.

Based on discussions with on-site personnel as well as review of previous environmental reports (summarized in Section 4.3.8), this listing pertains to the former ash landfill site, located to the west of Building 34 (Power Plant) on the north and south sides of Wheeler Road. See Section 4.3.8 and Section 5.6 for further discussion of the on-site ash landfill.

Resource Conservation and Recovery Act (RCRA) – Corrective Action Tracking System (CORRACTS)
RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. RCRAInfo replaces the data recording and reporting abilities of the Resource Conservation and Recovery Information System (RCRIS). The database includes selective information regarding sites that generate, transport, store, treat, and/or dispose of hazardous waste as defined by RCRA. The RCRA-CORRACTS database identifies TSD facilities that have conducted, or are currently conducting, corrective action(s) as regulated under RCRA. Neither the Subject Property nor any sites located within 1.0 mile of the Subject Property were identified on the RCRA CORRACTS database.

RCRA non-CORRACTS Treatment, Storage and/or Disposal (TSD) Facilities
RCRA non-CORRACTS Treatment, Storage and/or Disposal (TSD) facilities are required to register hazardous waste activity under the Resource Conservation and Recovery Act (RCRA). Neither the Subject Property nor any sites located within 0.5 mile of the Subject Property were identified on the RCRA non-CORRACTS TSD database

RCRA Hazardous Waste Generators
Hazardous waste generators tracked under the Resource Conservation and Recovery Act (RCRA) are classified as either Large Quantity Generators (LQGs), Small Quantity Generators (SQGs), or Conditionally Exempt Small Quantity Generators (CESQG). A RCRA-LQG is defined as a facility that generates over 1,000 kilograms (Kg) of hazardous waste, or over 1 Kg of acutely hazardous waste per month. A RCRA-SQG is defined as a facility that generates between 100 Kg and 1,000 Kg of hazardous waste per month. A RCRA-CESQG is defined as a facility that generates less than 100 Kg of hazardous waste, or less than 1 Kg of acutely hazardous waste per month. Neither the Subject Property nor any adjoining properties were identified on the RCRA Generator database.

Federal Engineering Control / Institutional Control Registries
The completion of site cleanup activities may include the implementation of engineering controls or institutional controls as part of the response action. Engineering controls include various forms of caps, building foundations, liners, and treatment methods to create pathway elimination for regulated substances to enter environmental media or effect human health. Institutional controls include administrative measures, such as groundwater use restrictions, construction restrictions, property use restrictions, and post remediation care requirements intended to prevent exposure to contaminants remaining on site. Deed restrictions are generally required as part of the institutional controls. Neither the Subject Property nor any sites located within 0.5 mile of the Subject Property were identified on Federal Engineering Control or Institutional Control Registries.

Emergency Response Notification System (ERNS)
ERNS is a national database used to collect information regarding reported releases of petroleum products and/or hazardous substances. The database contains information from spill reports submitted to Federal agencies, including the EPA, the U.S. Coast Guard, the National Response Center, and the U.S. Department of Transportation. A review of this database was conducted in order to determine whether any spills or incidents involving releases of hazardous substances or petroleum products have occurred at the Subject Property. The Subject Property was not identified on the ERNS database.

Federal RCRA Non-Generators Sites
The Subject Property is listed on the RCRA Non-Generators Sites database, which indicates that the site does not presently generate hazardous waste. The listing is dated January 18, 2012. This listing

indicates that the site was registered in 2010 as a Large Quantity Generator for Lead. No violations were reported during historical hazardous waste generation

4.1.2 State and Tribal Agency Database Records

State and Tribal equivalent NPL Sites and CERCLIS Sites

State and tribal equivalent NPL and CERCLIS databases were searched for sites located within 1.0 mile and 0.5 mile of the Subject Property, respectively. Neither the Subject Property nor any sites located within the specified minimum search distances were identified on state and/or tribal databases.

State and Tribal Spills Sites (Spills)

A review of available Spills databases was conducted in order to determine whether any spills or incidents involving releases of hazardous substances or petroleum products have occurred at the Subject Property. The Subject Property was identified on the Spills database. Information regarding the 17 Spills listings is presented in the following table:

STATE AND TRIBAL SPILLS SITES (SPILLS)			
Site	**Distance / Direction / Gradient***	**ID No.**	**Regulatory Status**
Harlem Valley Psych Center Rt 22 & Wheeler Road Wingdale, NY 12594	Subject Property	9012798	Spill Date: 3/13/1991 Contaminants: MTBE (METHYL-TERT-BUTYL ETHER) Media Impacted: Status: Closed Date of Closure: 1/12/2009
Har.Val.Psy.Cent.:Bd.#34 Station A - Building 34 Wingdale, NY	Subject Property	9810891	Spill Date: 11/30/1998 Contaminants: #2 Fuel Oil Media Impacted: Not reported Status: Closed Date of Closure: 4/1/2008
Harlem Valley Psych. Cntr Station A. POB 330 Wingdale - Dover 1, NY	Subject Property	8900727	Spill Date: 4/19/1989 Contaminants: Gasoline Media Impacted: Not reported Status: Closed Date of Closure: 6/26/1997
Har Val Pshy Cent Bld 67 Rte 22 Wingdale, NY	Subject Property	0004294	Spill Date: 7/10/2000 Contaminants: #2 Fuel oil Media Impacted: Soil Status: Closed Date of Closure: 9/19/2000
Harlem Valley Child Serv. Rte 22 Wingdale, NY	Subject Property	9402939	Spill Date: 5/31/1994 Contaminants: #2 Fuel Oil Media Impacted: Concrete floor Status: Closed Date of Closure: 6/3/1994
Formerly Harlem Valley Psychiatric Center Rte 22 Wingdale, NY	Subject Property	8709691	Spill Date: 2/16/1988 Contaminants: Gasoline Media Impacted: Not reported Status: Closed Date of Closure: 2/24/1988

STATE AND TRIBAL SPILLS SITES (SPILLS)			
Site	**Distance / Direction / Gradient***	**ID No.**	**Regulatory Status**
Harlem Valley Psych. Cen. Rte 22 Wingdale, NY	Subject Property	9206178	Spill Date: 8/27/1992 Contaminants: Waste oil/used oil Media Impacted: Surface Water Status: Closed Date of Closure: 9/11/1992
Dept. Of Corr. Housing Rte 22 Wingdale, NY	Subject Property	9501017	Spill Date: 4/25/1995 Contaminants: #2 Fuel Oil Media Impacted: Not reported Status: Closed Date of Closure: 5/26/1995
Hud.Val.Secure Cent. Rte 22 Harlem Valley, NY	Subject Property	9911484	Spill Date: 1/1/2000 Contaminants: #2 Fuel Oil Media Impacted: Not reported Status: Closed Date of Closure: 4/11/2000
Nys Har. Val. Secure: Raws Hudson Ave B-6 Wingdale, NY	Subject Property	0102528	Spill Date: 6/6/2001 Contaminants: Sewer sludge Media Impacted: Surface water Status: Closed Date of Closure: 6/6/2001
Harlem Valley Pych. Center Rte 22 Wingdale, NY	Subject Property	9109455	Spill Date: 12/4/1991 Contaminants: Raw Sewage Media Impacted: Soil Status: Closed Date of Closure: 12/9/1991
Harlem Valley Psych Ctr Wheeler Rd Wingdale, NY	Subject Property	9703270	Spill Date: 6/16/1997 Contaminants: Unknown Petroleum Media Impacted: Surface water Status: Closed Date of Closure: 6/17/1997
Harlem Valley Psychiatric Rte 22 Dover, NY	Subject Property	8807117	Spill Date: 11/29/1988 Contaminants: Diesel Media Impacted: Not reported Status: Closed Date of Closure: 12/5/1988
Harlem Valley Psych Ctr Wheeler Rd Wingdale, NY	Subject Property	9800233	Spill Date: 4/6/1998 Contaminants: Petroleum Media Impacted: Not reported Status: Closed Date of Closure: 4/8/1998
Harlem Valley Psych Rte 22 Wingdale, NY	Subject Property	9012800	Spill Date: 3/14/1991 Contaminants: Unknown Petroleum Media Impacted: Soil Status: Closed Date of Closure: 6/30/1991
Harlem Valley Psych Rte 22 Wingdale, NY	Subject Property	0308919	Spill Date: 11/21/2003 Contaminants: Blacktop Media Impacted: Status: Closed Date of Closure: 11/21/2003

STATE AND TRIBAL SPILLS SITES (SPILLS)			
Site	**Distance / Direction / Gradient***	**ID No.**	**Regulatory Status**
Har. Val. Secure Cent.#6 Hutchinson Ave Wingdale, NY	Subject Property	0011157	Spill Date: 1/12/2001 Contaminants: #2 Fuel Oil Media Impacted: Soil Status: Closed Date of Closure: 1/29/2001

All Spills listings for the Subject Property are listed with a status of Closed with the New York State Department of Environmental Conservation. EBI has requested additional information from NYS DEC regarding these closed spill numbers. As of the date of this report, no additional information has been received.

State and Tribal Landfill Sites and Solid Waste Disposal Sites

The state and tribal landfill and solid waste disposal site databases identify active or inactive landfill and transfer station facilities, as well as open dumps that failed to meet RCRA Subtitle D Section 4004 criteria for solid waste landfills or disposal sites. The Subject Property was not identified on state or tribal landfill and solid waste disposal site databases. However, one (1) site located within 0.5 mile of the Subject Property was identified on state or tribal landfill and solid waste disposal site databases. Information regarding the listed site is presented in the following table:

STATE AND TRIBAL LANDFILL SITES AND SOLID WASTE DISPOSAL SITES			
Site	**Distance / Direction / Gradient**	**ID No.**	**Facility Status**
South East Auto Recycle Inc 1492 Route 22 Wingdale, NY 12594	0.279 miles / South / Upgradient	S111711121	Facility Type: Vehicle Dismantling Facility Status: Active No Reported Violations

* Presumed hydrogeologic gradient based upon regional topography

Based upon the absence of reported violations and distance relative to the Subject Property, it is considered unlikely that conditions associated with the identified site represent an environmental concern to the Subject Property.

State and Tribal Leaking Storage Tank Sites

Leaking Storage Tank Sites are properties where releases of hazardous substances or petroleum products from underground storage tanks (USTs) and/or aboveground storage tanks (ASTs) have been identified and reported to state, tribal, or local agencies. Six (6) listings for the Subject Property as well as five (5) sites located within 0.5 mile of the Subject Property were identified on state or tribal Leaking Storage Tank databases. Of the listed sites not located on the Subject Property, four (4) sites were over 0.25 mile from the Subject Property. Based on distance from the Subject Property, these four sites are considered unlikely to represents an environmental concern to the Subject Property. Information regarding the remaining listings is presented in the following table:

STATE AND TRIBAL LEAKING STORAGE TANK SITES			
Site	**Distance / Direction / Gradient***	**ID No.**	**Regulatory Status**
Dover Knolls Dev.: 1.5K UST 73 Wheeler Road Wingdale, NY	Subject Property	1108479	Notification Date: 10/4/2011 Contaminants: #2 Fuel Oil Media Impacted: NA Status: Closed Date of Closure: 10/28/2011
Har. Val. Psy. Cent. :BD.#34 Station A – Building 34 Wingdale, NY	Subject Property	9810890	Notification Date: 11/30/1998 Contaminants: Hydraulic oil Media Impacted: #2 Fuel Oil Status: Closed Date of Closure: 12/3/1998
Harlem Valley Route 22 Wingdale, NY	Subject Property	8703175	Notification Date: 7/10/1987 Contaminants: Gasoline Media Impacted: Not reported Status: Closed Date of Closure: 9/23/1987
Formerly Harlem Valley Psychiatric Center Rte 22 Wingdale, NY 12594	Subject Property	9211052	Notification Date: 12/23/1992 Contaminants: #2 Fuel Oil Media Impacted: Not reported Status: Closed Date of Closure: 2/23/1993
Harlem Val Phy Cent Rt 22 Pawling, NY	Subject Property	8801968	Notification Date: 6/3/1988 Contaminants: #2 Fuel Oil Media Impacted: Not reported Status: Closed Date of Closure: 11/24/1995
Harlem Val Phy Cent Rt 22 Wingdale, NY	Subject Property	9108302	Notification Date: 11/1/1991 Contaminants: Diesel Media Impacted: Not reported Status: Closed Date of Closure: 11/4/1991
Wood 3516 Pleasantridge Rd Wingdale, NY	Adjacent / North / Downgradient	0402828	Notification Date: 6/15/2004 Contaminants: #2 Fuel Oil Media Impacted: Not reported Status: Closed Date of Closure: 10/29/2004

* Presumed hydrogeologic gradient based upon regional topography

Subject Property LTANKS listings each appear to have been opened due to failure of tank tightness tests for the tanks at the site. According to DEC notes included in the listings, each of the listings have achieved a status of closed/no further action. EBI notes that LTANKS listing 9108302 is listed with a note indicating that "Initial tank test inconclusive, retest shows hole in tank excavate to tank top. Tank and contam. soil removed 11/6/91. GW investigation to follow. NFA." EBI has requested additional information on any soil and/or groundwater investigation performed following this listing, however, as of the time of this report no additional information has been received. Based on the regulatory status of this listing, it is considered unlikely that conditions related to the LTANKS listings represent an environmental concern to the Subject Property.

Adjacent property 356 Pleasantridge Road was listed on the LTANKS database for a #2 fuel oil tank which occurred during a tank removal. The site has been closed. Based upon regulatory status, it is considered unlikely that conditions associated with the identified Leaking Storage Tank site represent an environmental concern to the Subject Property.

State and Tribal Registered Storage Tanks

The Subject Property and one (1) adjoining property was identified on state or tribal Registered Storage Tank databases. Information regarding the listed sites is presented in the following table:

STATE AND TRIBAL REGISTERED STORAGE TANKS				
Location	**Distance / Direction / Gradient**	**Tank # - Capacity (gal) / Contents**	**Year Installed**	**Status**
Dover Knolls Development Co. II, LLC 73 Wheeler Road Wingdale, NY 12594	Subject Property	1 – 20,000 / #2 Fuel Oil **UST**	10/01/1994	Temporarily Out of Service
		2 – 20,000 / #2 Fuel Oil **UST**	10/01/1994	Temporarily Out of Service
		641 – 1500 / #2 Fuel Oil **UST**	Not reported	In Service
		741 – 2000 / #2 Fuel Oil **UST**	Not reported	In Service
		3 – 4000 / #2 Fuel Oil **AST**	10/01/1994	In Service
		4 – 2000 / #2 Fuel Oil **AST**	10/01/1994	In Service
		5 – 1000 / Gasoline **AST**	06/01/1995	In Service
		6 – 500 / Diesel **AST**	06/01/1995	In Service
		7 – 1000 / Diesel **AST**	11/01/1999	In Service
Wingdale Mart PC No 070513 1551 Route 22 Wingdale, NY	Adjacent / South / Upgradient	1 – 8000 / Gasoline **UST**	08/01/1998	Closed (08/01/1998)
		1048 – 8000 / Gasoline/Ethanol **UST**	08/01/1998	In Service
		2 – 6000 / Gasoline **UST**	Not reported	Closed (08/01/1998)

* Presumed hydrogeologic gradient based upon regional topography

For further discussion of on-site underground and aboveground storage tanks, see Section 5.4.

Adjacent property Wingdale Mart PC is listed in the UST database. Based upon the absence of reported releases at this site it is considered unlikely that conditions associated with the identified state or tribal Registered Storage Tank site represent an environmental concern to the Subject Property.

State and Tribal Engineering Control / Institutional Control Registries

The completion of site cleanup activities may include the implementation of engineering controls or institutional controls as part of the response action. Engineering controls include various forms of caps, building foundations, liners, and treatment methods to create pathway elimination for regulated substances to enter environmental media or effect human health. Institutional controls include administrative measures, such as groundwater use restrictions, construction restrictions, property use restrictions, and post remediation care requirements intended to prevent exposure to contaminants remaining on site. Deed restrictions are generally required as part of the institutional controls. Neither

the Subject Property nor any sites located within 0.5 mile of the Subject Property were identified on state or tribal Engineering Control or Institutional Control Registries.

State and Tribal Voluntary Cleanup Sites
Neither the Subject Property nor any sites located within 0.5 mile of the Subject Property were identified on state or tribal Voluntary Cleanup Site databases.

State and Tribal Brownfield Sites
Neither the Subject Property nor any sites located within 0.5 mile of the Subject Property were identified on state or tribal Brownfield Sites databases.

New York State Delisted State Hazardous Waste Sites
The Subject Property is listed on the New York State Delisted State Hazardous Waste Sites database. This listing is for two dumps identified on the Subject Property. The listing describes the site as follows: "There are several small dumps on the property of the Harlem Valley Psychiatric Center. Each dump covers less than one acre. Dump #1 was used for disposal of furnace ash. Dump #2 was used for disposal of equipment. Another was used for hospital wastes and sewage sludge. There is one small sludge pit at the top of the hill. There is a wetland adjacent to the site. An EPA Site Investigation has been completed. A Phase I investigation has been completed. A Phase II investigation has also been completed. There is no record of hazardous waste disposal at this site. This site will be referred to the Division of Solid Waste."

EBI notes that Dump #1 is located on the adjacent property to the east of the Subject Property, which is owned by the state. Dump #2 is located on the Subject Property. For additional information regarding these two dump sites see Section 4.3.8 and Section 5.6.

4.1.3 Local Regulatory Agency Records

Local municipal offices consulted during the completion of this assessment included the following: Dutchess County Assessor's Office, Dutchess County Department of Health, Town of Dover Building Department, Planning Department, Town Clerk's Office, and Fire Department. EBI did not identify additional information regarding environmental conditions at the Subject Property, with the exception of the following.

Dutchess County Assessor's Office
EBI reviewed available information regarding the Subject Property on the Dutchess County Assessor's Office Parcel Access. Information on Subject Property parcels is included in relevant portions of this report. In addition, historical aerial photography was reviewed, and summaries of these photographs are included in Section 4.3.1.

Dutchess County Water and Wastewater Authority (DCWWA)
EBI submitted a written request to the Dutchess County Water and Wastewater Authority (DCWWA) for information regarding the Subject Property, in accordance with the Freedom of Information Act (FOIA). EBI received a response from the Dutchess County Water and Wastewater Authority (DCWWA) on August 27, 2013, indicating that several documents were available for review at the DCWWA office, including the Full Environmental Impact Statement as well as the Draft Environmental Impact Statement, which are both available on the Town of Dover website, as well as an Engineering Feasibility Study for proposed DCWWA ownership and operation of the water and wastewater facilities on site. EBI has reviewed relevant portions of the Full Environmental Impact Statement, and information is included in the appropriate sections of this report. No other information available from the DCWWA pertains to the subsurface environmental conditions at the Subject Property.

Town of Dover Building Department
EBI reviewed available files at the Town of Dover Building Department. EBI did not identify original building permits, or files pertaining to the environmental conditions of the Subject Property.

Town of Dover Planning Department
EBI spoke with Betty-Ann Sherer of the Planning Department, who indicated that zoning at the Subject Property varied over the site, and that a Mixed Commercial Overlay had been placed over a portion of the site conditional on the former Dover Knolls development plans. No files pertaining to the environmental conditions of the Subject Property were identified at the Planning Department.

Town of Dover Clerk's Office
EBI spoke with Bonnie of the Town of Dover Clerk's Office, who indicated that the Clerk's Office does not maintain records for underground storage tank registrations.

Town of Dover Fire Department
EBI contacted Brian Kelly of the J. H. Ketcham Hose Co. (Dover Fire Department) who indicated that the Fire Department "keeps no such records/files for the former HVPC on any underground storage tanks, aboveground storage tanks, oil, or hazardous materials."

4.2 PHYSICAL SETTING

4.2.1 Topography

The Subject Property is located at an elevation ranging approximately 420 to 920 feet above mean sea level (msl). The topography of the Subject Property is hilly, with a somewhat steep slope at the eastern portion of the Subject Property. Elevation is lower along the banks of the Swamp River, and land at the Subject Property generally slopes downward toward the river. A reservoir is located at the eastern portion of the Subject Property. The Subject Property is located in a hilly area just east of the Hudson Valley. Figure 2 - Locus Map, which depicts the location of the Subject Property on the Dover Plains, New York USGS 7.5 Minute Topographic Quadrangle.

4.2.2 Geology and Soils

No bedrock outcroppings were observed at the Subject Property. Information concerning the geology of the Subject Property was obtained from the USGS Groundwater Atlas, New York region (1995). The Subject Property is located within the New England physiographic province, which is underlain by metamorphic and sedimentary rocks of the Cambrian and Ordovician period.

According to the Natural Resources Conservation Service (NRCS) Web Soil Survey (WSS) website (http://websoilsurvey.nrcs.usda.gov/app/), soil at the Subject Property is a mixture of 25 identified soil types. The three dominant soil types are Carlisle Muck (Cc), Stockbridge silt loam, 8 to 15 percent slopes (SKC) and Udorthents, smoothed (Ud). Carlisle Muck is characterized by a parent material of deep organic material, which creates very poorly drained soil, with a typical profile of muck, which is primarily made up of humus. Stockbridge silt loam, 8 to 15 percent slopes is characterized by a parent material of calcareous loamy till, which leads to well drained silt loam soil. Udorthents, smoothed is a well drained soil, characterized by gravelly loam, underlain by very gravelly loam.

4.2.3 Hydrogeology and Hydrology

A reservoir is located at the eastern portion of the Subject Property. The water is held by a dam and channeled through a water treatment system for use as potable water at the site. Additionally, the

Swamp River runs through the central portion of the site, to the west of Route 22, in a northerly direction. Swamp River discharges to the Housatonic River in Connecticut, which ultimately drains to into Long Island Sound to the south.

Local groundwater gradient is expected to follow surface topography; therefore, groundwater flow near the Subject Property is expected to flow generally to the north. However, given the large size of the Subject Property, it is expected that specific groundwater flow direction varies across the site. Groundwater depths and flow gradients are best evaluated by a subsurface investigation involving the installation of at least three groundwater monitoring wells and precise measurements of hydrostatic pressure. EBI observed approximately 26 monitoring wells at the Subject Property, in the vicinity of Building 34. Additionally, EBI reviewed documentation of previous groundwater sampling in the vicinity of the ash landfills to the north and south of Wheeler Road and to the west of Building 34, which indicated a groundwater flow direction to the west, toward the Swamp River. For further discussion of groundwater monitoring wells, see discussion of the Closure Investigation Report For South Side of Wheeler Road in Section 4.3.8.

4.3 Historical Use of the Subject Property and Adjoining Properties

EBI attempted to determine the history of the Subject Property dating back to 1940 or first developed use. The following table summarizes the historical use of the Subject Property and surrounding area.

Historical Use Summary			
Period	Historical Uses		Source(s)
	Subject Property	Surrounding Area	
At least 1901-1911	Undeveloped, wooded land. Hudson River Railroad appears in the central portion of the Subject Property (Present-day Metro North Rail Line).	Primarily Undeveloped; limited single-family residential estates/farms	Topographic Maps Municipal Records Personal Interviews Previous Reports
1911-1918	Four buildings including the dam and reservoir were constructed for the original intended use as a prison (Buildings 2,3,7 and 10)	Primarily Undeveloped; limited single-family residential estates/farms	Municipal Records Previous Reports
1918-1937	Buildings 1, 3, 4, 5, 6, 11, 12, 13, 14, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35 staff houses, golf course, dairy farm, root cellar, piggery and chicken houses constructed at the Subject Property.	Primarily Undeveloped; limited single-family residential estates/farms	Topographic Maps Municipal Records Personal Interviews Previous Reports
1937-1963	Addition of several staff houses including building 107. Hospital (Building 85) constructed in 1963.	Single-family residential and undeveloped land.	Aerial Photographs Topographic Maps Municipal Records Personal Interviews Previous Reports
1963-1981	Continued operation as a State Mental Institution. Limited development.	Single-family residential and undeveloped land.	Aerial Photographs Topographic Maps Municipal Records Personal Interviews Previous Reports

HISTORICAL USE SUMMARY			
Period	Historical Uses		Source(s)
	Subject Property	Surrounding Area	
1981-1994	Operation of juvenile detention facility (NYS DFY) in buildings 4, 5, 6 11 and 12. Former hospital officially closed by the state in January of 1994.	Single-family residential and undeveloped land.	Aerial Photographs Topographic Maps Municipal Records Personal Interviews Previous Reports
1994-2004	Operation of juvenile detention facility (NYS DFY) in buildings 4, 5, 6 11 and 12. Dam gate house and several farm structures destroyed by fire between 1996-2004.	Single-family residential and undeveloped land.	Aerial Photographs Topographic Maps Municipal Records Personal Interviews Previous Reports
2004 to Present	Property occupied by Dover Knolls Realty LLC. Buildings 4, 5 and 6 demolished.	Single-family residential and undeveloped land.	Aerial Photographs Topographic Maps Municipal Records Personal Interviews Previous Reports

Based on historic review of the Subject Property, the following environmentally significant conditions were identified on the Subject Property or surrounding properties during the historical review:

- Historic use and storage of petroleum products throughout the Subject Property.
- Onsite coal fired power generation including land filling waste coal ash.
- Historic dumping at multiple locations throughout the Subject Property.
- Pesticide and herbicide storage.
- Hazardous materials storage.
- Onsite transformers.

4.3.1 Aerial Photographs

Historical aerial photographs may be used to evaluate changes in land use and to identify visible areas of potential environmental concern. A search for historical aerial photographs depicting the Subject Property and vicinity was conducted by Environmental Data Resources, Inc. (EDR). In addition, aerial photographs were obtained from the Dutchess County Parcel Access online mapping website (www.geoaccess.co.dutchess.ny.us). Aerial photographs depicting the Subject Property were reviewed and are summarized in the following table. Copies of the aerial photographs are presented in Appendix G.

AERIAL PHOTOGRAPH SUMMARY		
Year	Issues Noted	Observations
1936	No	**Subject Property:** The majority of the property appears to exist as it does present day, with construction on most of the major buildings completed.
		Surrounding Area: The area surrounding the Subject Property appears to consist mostly of undeveloped wooded land, with some limited single-family residential development.
1940s, 1941	No	**Subject Property:** Conditions on the Subject Property appear to be similar to those depicted in the 1936 photograph.
		Surrounding Area: Conditions on the surrounding properties appear to be

AERIAL PHOTOGRAPH SUMMARY		
Year	**Issues Noted**	**Observations**
		similar to those depicted on the 1936 photograph.
1955	No	**Subject Property:** Conditions on the Subject Property appear to be similar to those depicted in the 1936 photograph, with the addition of the golf course on the northwestern portion of the property.
		Surrounding Area: Conditions on the surrounding properties appear to be similar to those depicted on the 1941photograph, with increased residential development depicted south of the Subject Property.
1970, 1971, 1974, 1980, 1981, 1990, 1991, 1994, 1995, 1997, 2000, 2004, 2006, 2008, 2009	No	**Subject Property:** The majority of the property appears to exist as it does present day, with a major additions including Building 85 (Hospital) in 1963 and the Secondary Power Plant (Building 5a) in 1994.
		Surrounding Area: Conditions on the surrounding properties appear to be similar to those depicted on the 1955 photograph.
2011	No	**Subject Property:** Buildings 4, 6 and a portion of Building 5 have been demolished. The remaining portions of the Subject Property appear as they exist present day.
		Surrounding Area: Conditions on the surrounding properties appear to be similar to those depicted on the 2009 photograph.

4.3.2 Fire Insurance Maps

A search for historical fire insurance maps depicting the Subject Property and vicinity was conducted by EDR Sanborn Maps, Inc. The EDR Report indicated that coverage for the vicinity of the Subject Property was not available. A copy of the search documentation letter is presented in Appendix G.

4.3.3 Topographic Maps

Historical topographic maps provide information related to physical land configuration such as elevation, ground slope, surface water and other features. While most buildings in densely developed urban centers are not depicted, topographic maps typically show structures equal to or larger than the size of a single-family residence in rural areas. Other notable features such as woods, pipelines, municipal boundaries, and areas of filled land are often marked on topographic maps. A search for historical topographic maps depicting the Subject Property and vicinity was conducted by Environmental Data Resources, Inc. (EDR. Historical topographic maps depicting the Subject Property were reviewed and are summarized in the following table. Copies of the topographic maps are presented in Appendix G.

TOPOGRAPHIC MAP SUMMARY		
Year	**Issues Noted**	**Observations**
1901	No	**Subject Property:** Swamp River, the Hudson River Railroad, present day Wheeler Road and State Route 22 are depicted on the Subject Property. Several structures area depicted on the eastern portion of the property.
		Surrounding Properties: The area surrounding the Subject Property appears to be undeveloped land.
1947	No	**Subject Property:** The majority of the structures and roadways are depicted as they exist present day, with the exception of Buildings 4, 5 and 6.
		Surrounding Properties: Increased residential development is depicted on the surrounding properties.
1958	No	**Subject Property:** The conditions on the Subject Property appear to be similar to those depicted in the 1947 map, with the additions of the golf course on the northwestern

TOPOGRAPHIC MAP SUMMARY		
Year	**Issues Noted**	**Observations**
		portion of the property. A cemetery is depicted on the southwestern portion of the property.
		Surrounding Properties: Increased residential development is depicted on the surrounding properties.
1971, 1976, 1984, 1988	No	**Subject Property:** The conditions on the Subject Property appear to be similar to those depicted in the 1958 map, with the addition of Building 85 (Hospital).
		Surrounding Properties: Conditions on the surrounding properties appear to be similar to those depicted in the 1958 map.

4.3.4 Street Directories

Street directories are commercial publications containing names and addresses, and in many cases, occupations of the occupants of a particular community. The directories may also contain information pertaining to business processes conducted within a community. A search for historical street directories was conducted by Environmental Data Resources, Inc. (EDR). The EDR Report indicated that coverage for the vicinity of the Subject Property was not available. A copy of the search documentation letter is presented in Appendix G.

4.3.5 Recorded Land Title Records

Land title records provide information on previous ownership of a property. Typically, deeds signifying transfer of a land parcel are recorded in county files and can be researched to determine the identity of past owners. A "chain of title" is a continuous record of ownership for a specific parcel. A 50-year chain of title search was not included in the scope of work for this assessment.

4.3.6 Property Tax Records

The property card for the Subject Property was obtained at the Dutchess County online Assessor's Database. The property card identifies the current owner as Dover Knolls Development Co LLC and Benroal Realty Associates LP, which acquired the Subject Property between 2003 and 2007. A listing of the former Subject Property owners was not available for review. Copies of the property tax records are presented in Appendix C.

PROPERTY TAX RECORDS		
Transfer Date	**Issues Noted**	**Owner**
2003	No	New York State Office of Mental Health

4.3.7 Environmental Liens and Activity and Use Limitations

A search for Environmental Liens and Activity and Use Limitations was not included in the scope of this assessment.

4.3.8 Previous Environmental Reports

EBI was provided with the following previous environmental reports performed for the Subject Property. Relevant information from the previous reports is discussed in the appropriate sections of this report, and portions of the previous reports are presented in Appendix H.

4.3.9 Previous Environmental Site Assessments

Phase I Environmental Site Assessment, Harlem Valley Psychiatric Center located at Route 22, Dover, New York, prepared by Professional Service Industries, Inc. (PSI) of Latham, New York, dated October 31, 1996

The PSI Report was completed in general conformance with ASTM Standard E 1527-94. The scope of the PSI investigation included visual reconnaissance of the Subject Property, interviews with knowledgeable persons associated with the Subject Property, review of available regulatory information contained within federal and state environmental databases and other local environmental records, review of the physical characteristics and history of the Subject Property. The following information was presented in the PSI Report:

- At the time of the PSI Report, the Subject Property had been a vacant mental hospital for several years. Based on the earliest construction date of facility buildings, the facility appears to have been open since the 1930s. Limiting factors during the investigation included dense vegetation which had overgrown the vacant portions of the property.

- At the time of assessment, the existing structures were predominantly vacant. Occupied structures on the property included two (2) buildings occupied by the Division For Youth (DFY), six (6) buildings occupied by corrections personnel, and four buildings occupied by patients and or staff. The golf course and support buildings on the west side of the property were also operational.

- PSI offered the following text with regard to historical use of the Subject Property, "Review of aerial photographs reveal that the subject site area west of Rome 22 was farmland where crops and livestock were raised. This former agricultural use provided the food supply for the facility. Aerial photographs also revealed what appeared to be the landfill areas on the subject site. These landfills were confirmed by several sources."

- PSI identified 55-gallon drums of lubrication oil, automotive fluids, machine oil, waste oil and hydraulic oil in several of the buildings throughout the Subject Property. The conditions of the drums varied from poor to good, with some staining and/or pooling noted in Buildings 34, 61, 55 and 103.

- "Dump #1 was located in a wooded area at the east side of the subject site near the reservoir. A Phase II investigation report, dated April 1991 and prepared by Engineering Science, Inc. (ESI), was reviewed for this dump. This report indicated that Dump # 1 was used from the initiation of the facility in the 1930s through 1968. Approximately 25,000 cubic yards of waste was reportedly disposed of (see section 5.5). This waste included ash from the power plant incinerator. The size of the dump was reported to be approximately two acres. Monitor wells were installed and soil and groundwater samples were collected and analyzed. The Phase II sample analyses indicated the presence of groundwater contamination by metals including barium, chromium, lead, iron, magnesium, and manganese."

- "Dump #2 is located west of the sewage treatment plant on a small hill. Disposal of approximately 17,000 cubic yards of waste reportedly consisting of hospital trash, landscaping debris, fuel tanks, partially filled drums, lead acid batteries, furniture, white goods, and old machinery reportedly took place from 1968 to 1975. The area of this landfill is estimated to be two acres. Five monitor wells were installed at this dump and sample analyses indicated groundwater contamination with tetrachloroethene (PCE), iron, lead, and manganese."

- PSI concluded that Dump #1 and Dump #2 are considered *recognized environmental conditions.*

- PSI observed 22 ASTs and 12 USTs at the Subject Property during their site reconnaissance.

- PSI reported observed pole-mounted and pad mounted transformers throughout the Subject Property. According to the PSI report, "Mr. Brian Finley, DFY's Maintenance Supervisor I, stated that all transformers on the facility were tested for polychlorinated biphenyls (PCBs). Any transformers containing PCBs were replaced by non-PCB transformers."

- Based upon the findings of the Phase I Environmental Site Assessment, PSI identified the following recognized environmental conditions (RECs) associated with the Subject Property and offered the following recommendations:

    - The on-site ash pile and the LUST have impacted the subject site groundwater, however, remediation is in progress for the LUST.
    - The landfills located on-site appear to have impacted the site's groundwater.
    - The on-site USTs have a significant potential to contaminate the subject site if impacts have not already occurred.
    - All suspect ACBM should be assumed to be asbestos unless sampling indicates otherwise.
    - Paints encountered in buildings constructed prior to 1978 should be assumed to contain lead-based paints unless sample results indicate otherwise. Leaching of lead from demolition debris from some on-site buildings may be a concern.
    - Average radon levels indicate a potential radon concern for the subject site buildings.

Phase I Environmental Site Assessment, Former Harlem Valley Psychiatric Center located at NYS Route 22 and Wheeler Road, Dover, New York, prepared by Freudenthal & Elkowitz Consulting Group, Inc. (F&E) of Islandia, New York, dated December 2008.

The F&E Report was completed in general conformance with ASTM Standard E 1527-05. The scope of the F&E Report investigation included visual reconnaissance of the Subject Property, interviews with knowledgeable persons associated with the Subject Property, review of available regulatory information contained within federal and state environmental databases and other local environmental records, review of the physical characteristics and history of the Subject Property. The following information was presented in the F&E Report:

- At the time of the F&E Report, the Subject Property was vacant and was improved as it exists present day. According to the Town of Dover Tax Assessor, the property was owned by Dover Knolls Development Company II, LLC. and Benroal Realty Associates.

- According the F&E report, "The subject property is currently developed with 83 buildings and other structures, associated roadways/pathways, nine-hole golf course, two cemeteries, a dam and a reservoir. The property, which was formerly utilized as the NYS HVPC and NYS Division for Youth (DFY) Juvenile Detention Facility, is currently in the process of being redeveloped into a mixed-use community with residential, retail and recreational uses, known as the Knolls of Dover (a.k.a., Dover Knolls)."

- F&E's review of the site history revealed the following, "From the review of historic aerial photographs, historic topographic maps, Town of Dover Assessor's records, and information obtained from the harlemvalley.org website, as well as personnel interviews, F&E was able to establish a history of the subject property back to 1901, although some of the original residential homes on the property, reportedly date back to 1890, with one home, possibly the Manor House (Building 39), dating back to circa 1835. From 1901 until 1911, the subject property was comprised of several residential estates/farm properties, including the Wheeler, Titus, Wilcox and Brown farms, as well as the former Dykeman property. In 1911, the farms were purchased by NYS for the purpose of creating a prison. The original prison plans called for the construction of 14 buildings, a reservoir and a wall surrounding the buildings, with an additional six buildings to be constructed in a second phase. The former HVPC property was acquired by Dover Knolls in 2004, with the NYS DFY occupying portions of the site until early 2004."

  - According to the F&E report, the following petroleum storage tanks were identified:

    - Four 275-gallon, steel USTs containing fuel oil, installed in 1989 and removed in July 2000
    - One 8,000- gallon, steel AST containing diesel fuel , installed in 1990;
    - One 275-gallon, steel AST containing fuel oil, removed in 1996;
    - Two 275-gallon, steel ASTs containing fuel oil, installed in 1953 and removed in 1996
    - One 275-gallon, steel AST containing fuel oil, installed in 1953 and removed in 2000
    - Two 275- gallon, steel ASTs containing fuel oil, installed in 1992 and removed in 2000
    - One 4,000-gallon, fiberglass reinforced plastic (FRP) UST containing fuel oil, installed in 1986
    - One 1,000-gallon, steel UST containing fuel oil, installed in 1989 and removed in 2000
    - One 2,000-gallon, steel UST containing gasoline, in stalled in 1975 and removed in1997
    - One 5,000-gallon, steel UST containing gasoline, installed in 1975 and removed in1997
    - One 500-gallon, steel UST containing diesel fuel, removed in 1991
    - One 500-gallon, FRP UST containing fuel oil, installed in 1989 and removed in 2000;
    - One 500-gallon, steel UST containing fuel oil, installed in 1989, closed in 1996 and removed in 2000
    - One 1,000-gallon, steel UST containing fuel oil, removed in 2000
    - Two1,000 -gallon, steel USTs containing fuel oil, closed in 1996
    - One 550-gallon, steel UST containing fuel oil, removed in 2000;
    - One 1 ,SOO-gallon, steel UST containing fuel oil, removed in 1991
    - Two 1,500-gallon, steel USTs containing fuel oil
    - One 2,000-gallon, steel UST containing fuel oil, removed in 2000
    - One 1,000-gallon, steel UST containing fuel oil, installed in 1988 and removed in1996
    - One 500-gallon, steel UST containing fuel oil, removed in 2000
    - One 2,000-gallon, steel UST containing fuel oil
    - One 2,000-gallon, steel UST containing fuel oil, installed in 1964 and removed in 2000

- The F&E report identified the following registered Petroleum Bulk Storage (PBS) ASTs and USTS at the Subject Property:

- Two 20,000-gallon, FRP USTs containing fuel oil, installed in 1994
- One 4,000-gallon, steel AST containing fuel oil, installed in 1994
- One 2,000-gallon, steel AST containing fuel oil, installed in 1994
- One 1,000-gallon, concrete AST containing gasoline, installed in 1995
- One 500-gallon, concrete AST containing diesel fuel , installed in 1995
- One 1,000-gallon, steel AST containing diesel fuel, installed in 1999
- Four 4,000-gallon, steel ASTs containing fuel oil, installed in 1994

The F&E Report included the following findings:

- Based on the results of the site inspection, records review and interviews, it was determined that there were RECs with regard to the subject site. RECs are those conditions, which could adversely affect the environmental integrity of the property. The RECs are summarized below:

  - Four on-site dumps/landfills were identified for the site (ash fill , HVPC Dump No.2, Old Golf Course Landfill and the sewage screenings dump area), of which, three have documented groundwater impacts. The sewage screenings area has not been investigated.
  - Given the history of agricultural use at the property (former Dykeman Farm and portions of the former HYPC), it is likely that pesticides and/or fuel oils (as a dispersant agent for the aforementioned products) were periodically applied. As such, these materials were also likely formerly stored and handled on-site. No representation can be made as to the residual concentrations of these chemicals within the surficial soils on the property.
  - As portions of the former HYPC have been in use as a golf course/country club since circa 1928, it is likely that on-site soils contain some residual concentrations of pesticides.
  - Two active NYSDEC spills, with at least one showing documented evidence of soil and groundwater impacts, as well as the presence groundwater monitoring wells and inactive remediation equipment in the vicinity of the Building 34 garage area.
  - Observed staining and impacted soils in the vicinity of the gasoline AST at the golf course maintenance building, with the potential to impact groundwater.
  - USTs currently present on the site, those which may have been associated former onsite buildings, as well as removed USTs where no removal or soil quality documentation is available have the potential to have impacted the subsurface.
  - Storm drains, floor drains and/or on-site sanitary disposal systems which discharge directly to surrounding soils have the potential to impact the subsurface.

Based upon the above findings and conclusions, and given that the Dover Knolls Development Company II, LLC intends to develop the subject property in a phased approach, the following recommendations are made to facilitate the re-development of the property in a manner that is protective of human health and the environment, while allowing Dover Knolls the flexibility to address the identified environmental concerns on a site-wide or building-by-building basis depending on their budget. In addition, due to the complex nature of the site, some environmental concerns will likely require long term investigation, monitoring, remediation and/or mitigation with the oversight of one of more regulatory agencies.

  - Although the ash fill area was reportedly remediated under an Order on Consent between the NYSDEC and NYSOMH, no remediation or post-remedial monitoring information was provided for review. Therefore, it is likely that residual quantities of fill (ash) and impacted groundwater remain present at the site. As such, any fill materials excavated from this area during the proposed development activities, should be adequately characterized. If contamination is present, the soil should be dealt with as part of Soil Management Work Plan (SMP) and Health and Safety Plan (HASP). These procedures would generally consist of the

following: (a) retaining a Part 364 permitted environmental contractor to excavate, characterize, transport and dispose of impacted soils at the appropriately- licensed disposal facility; and (b) backfilling the excavations with clean fill material. All impacted material should be transported, with appropriate manifesting.

Please note that as the previous investigation and remediation was conducted with oversight provided by the NYSDEC, no further investigation or remediation may be warranted at this location. However, it may be prudent to construct any new residential structures in this area with vapor barriers and/or sub-slab depressurization systems to ensure the protection of future building occupants.

- Groundwater analytical data collected as part of a prior site investigation identified the presence of impacts by PCE and heavy metals. Although, no investigation reports were provided for review, the detected groundwater concentrations were considered insignificant enough to warrant removal of the dump from the NYS SHWS list. As no development is currently proposed for this area, no recommendations are warranted at this time. It should be noted that the site is currently under the regulatory jurisdiction of the NYSDEC Division of Solid Waste. Although this site is likely considered a "low" priority, this agency may require that the dump be closed in accordance with 6 NYCRR Part 360 regulations, including but not limited to capping, gas collection and groundwater monitoring.

- Although no information regarding the nature of the materials discarded in the Old Golf Course Landfill was available, it is likely that the majority of the debris consisted of landscaping debris. Given the proximity of this dump site with HVPC Dump No. 2, and the possibility that this dump is synonymous with the southern dump area of HPCV Dump No.2, the evaluation of groundwater completed for HVPC Dump NO.2 was likely adequate to evaluate the effects (if any) associated with this landfill. As no development is currently proposed for this area, no recommendations are warranted at this time. It should also be noted that this dump appears to be located within or proximate to a NYS wetland area and it is unlikely to be developed.

- Based on the presumed nature of the materials discarded at the sewage screenings dump area, it is unlikely that these materials have leached contaminants to the ground and significantly impacted the site. However, F&E recommends these materials be removed and properly disposed in accordance with applicable regulations. In the event that soil impacts (e.g., visible staining) are noted, then F&E recommends soil sampling be conducted to determine the nature and extent of the impacts and determine if additional investigation and/or remediation is warranted.

- Based on the intended future use of the property as residential or related purposes, a soil investigation program should be conducted to ascertain the presence, if any, of accumulated pesticides (e.g., pesticides, herbicides, semi-volatile organic compounds [SVOCs], and heavy metals) in surficial soils. Such sampling may be required by the DCDOH and/or Town of Dover prior to a sub-division plan approval. If present, pesticides, SVOCs and metals would be dealt with as part of SMP and HASP similar to the ash fill area (see above).

- The presence of pesticides in soil at the golf course does not currently warrant investigation/remediation. However, should the future use of the property change, specifically to residential usage, the sampling and/or remediation of pesticide impacted soils would likely be necessary as part of construction/re-development activities.

- The NYSDEC should be contacted regarding the two active petroleum spills associated with Building 34. Based on a review of the database information, the remediation of the spill at Building 34 garage appeared completed, but additional work including the decommissioning of the former remediation system and monitoring wells was required. However, due to the time elapsed since the last monitoring report was submitted, the NYSDEC may require additional sampling or other work be completed prior to closure of the spill file. The other spill appeared minor (two gallons) and likely requires minimal efforts to obtain closure of the spill file.

  In addition, as residual soil and groundwater impacts may remain present beneath the site following the NYSDEC's approval for spill closure, it may be prudent to construct any new residential structures with vapor barriers and/or sub-slab depressurization systems to ensure the protection of future building occupants. Further, any impacted soils excavated from this area should be properly characterized and disposed of at an appropriate off-site facility.

- Spills in the vicinity of the 275-gallon gasoline AST associated with Building 60 (golf course maintenance building) have impacted surface soils. The soil staining is unlikely to have resulted in significant soil/groundwater impacts, however, effected soils should be removed and properly disposed. In addition, better housekeeping practices, secondary containment and/or upgraded ASTs are recommended to minimize/prevent future spills/releases.

- As the future use of the property does not likely include use of the out-of-service USTs, same should be removed in accordance with applicable NYSDEC regulations. F&E recommends that the out-of- service USTs be removed in a phased approach, in association with the proposed demolition activities. As the majority of the out-of service USTs are reportedly empty and disconnected from associated heating/fueling equipment, tightness testing is not recommended. However, any USTs scheduled to remain in-service or placed back in-service should be properly evaluated through tightness testing or soil borings.

- The former site USTs appear to have been properly removed including the notification of the applicable regulatory agencies, however, the information regarding the tank removals (i. e. tank closure report) was not made available to F&E prior to the issuance of this Phase I ESA report. Additional information requests made to the NYSDEC and the DCDOH, to confirm that releases from the former USTs did not impact the subsurface, are still pending. In the event that information becomes available to F&E indicating that a release was associated with a removed UST. Which was not adequately resolved, then a targeted Phase II ESA may be recommended as an addendum to this report.

  As 20 of the 22 documented NYSDEC spills associated with the subject property have been closed by the NYSDEC, F&E does not recommend a Phase II ESA in association with the removed USTs. However, F&E does acknowledge that residual subsurface petroleum-related impacts may be present at multiple locations throughout the site. Therefore, in the event that petroleum-related impacts are encountered during site development activities, same should be reported to the NYSDEC within two hours of discovery (as prescribed by law) and handled in accordance with applicable NYSDEC regulations.

- The nature and discharge points of the identified on-site sanitary systems, storm drains, areas, floor drains, etc. should be determined and if warranted, soil samples should be collected from the base of the structures to determine if current/historic site operations and/or improper discharges to the structure have impacted the subsurface and if remediation is required.

Please note that based on the initial sample results, additional sampling may be required to assess liquid and/or sludge present in the septic tanks, for disposal purposes (if required) and/or to satisfy regulatory agency requirements. In addition, if future redevelopment of the property does not include the use of these structures, they should be properly closed in accordance with US EPA protocols.

In addition to the RECs, F&E identified several environmental concerns. The environmental concerns and F&E's recommendations are summarized as follows:

- NYSDEC PBS registrations should be updated to include all current and former tanks associated with the property. The discrepancies associated with the three existing PBS registrations for the property should be resolved and ownership of the appropriate tanks transferred to the Dover Knolls Development Co. II, LLC. In addition, if future plans for the site do not include the use of the any or all of the onsite ASTs, then the tanks should be removed from the site in accordance with applicable NYSDEC regulations.

- The storage of chlorine and other chemicals associated with the water and sewer treatment plants may require registration with the NYSDEC in accordance with CBS regulations as the stored volume appears to exceed 185 gallons. Storage areas should also be upgraded to provide secondary containment and spill protection.

- Various laboratory chemicals, drums, compressed gases, paints and cleaning supplies located throughout the site buildings, should be removed from the site and properly disposed in accordance with applicable regulations. Any materials which may be utilized by Dover Knolls, should be properly stored with the appropriate spill containment and applicable permits/registrations.

- Interior paints associated with the majority of the unoccupied/inactive buildings on the property show moderate to severe evidence of chipping/peeling paint. The exteriors of the on-site residences and several smaller structures were painted, with the painted surfaces in fair to poor condition, similar to the interior surfaces. The lead contents of the paints are unknown, but due to the ages of the buildings, the presence of LBP is possible. Therefore, F&E recommends that lead paint surveys be conducted prior to any renovation/demolition activities. The disposal of lead paint waste resulting from renovation or demolition activities may be subject to federal and State regulations.

- Various suspect ACM were identified throughout most of the site buildings, including, but not limited to floor tile, ceiling tile, pipe insulation, boiler insulation, fireproofing and roofing materials. Generally, the suspect materials were in good to fair shape except for areas which were damaged by vandalism and/or water damage. In addition, due to the ages of the buildings, except for the Manor House (Building 39) which was recently renovated, other (inaccessible) building materials may also contain asbestos.

  If activities in the buildings (i.e., renovation or demolition) will disturb any suspect asbestos material, then F&E recommends that an asbestos survey be performed to determine if ACM are present prior to the proposed work. If ACM are present, then a New York State-licensed contractor must be retained to remove the asbestos in accordance with federal and State regulations.

- Suspect PCB-containing equipment, including, but not limited to fluorescent light ballasts, elevator equipment, transformers and hydraulic vehicle lifts were identified on the property. As such, F&E recommends that PCB surveys be performed prior to demolition and/or renovation activities. Any PCB-containing equipment affected by the development of the site must be properly managed during demolition and/or renovation activities. In addition, while the disposal of *non-leaking* PCB ballasts is not currently regulated by the USEPA, F&E recommends that the PCB ballasts be packaged in a lined, steel drum containing an absorbent material and disposed of as PCB-waste to reduce the potential for environmental contamination and potential liability for cleanup of any environmental release of PCBs from the ballasts.

- For those structures which **are** proposed to be renovated/reused, any areas affected by water damage should be repaired and subsequently inspected for the presence of mold growth. Any evidence of mold should be cleaned and removed in accordance with the NYSDOH Guidelines on Assessment & Remediation of Fungi in Indoor Environments prior to occupancy.

- As the Wingdale area is classified by the USEPA as a Zone I radon risk area, radon testing should be performed, and if necessary sub-slab depressurization systems or passive radon ventilation systems should be installed in any proposed buildings (as necessary) to protect future occupants from potential radon exposure.

- Under the Freshwater Wetlands Act, the NYSDEC administers a permit program regulating activities in freshwater wetlands and their adjacent areas extending up to 100 feet from the wetland boundary. The NYSDEC requires a permit for almost any activity which will alter wetlands or the adjacent areas, including: the construction, reconstruction, and or expansion of structures; movement of earth material; and land clearing. Federal wetlands are protected under the jurisdiction of the United States Army Corps of Engineers and a Corps Permit may be required prior conducting any work on the property which will alter the wetlands and/or the adjacent areas, including: the construction, reconstruction, and or expansion of structures; land clearing, the movement of earth material ; and the subdivision of land. Therefore, the presence of NYS freshwater and federal wetlands on and adjacent to the subject property will likely impact and/or restrict the future use and development of the property.

- FEMA FIRMs indicate that portions of the subject property located along the east and west sides of the Swamp River, as well as along its tributary on the eastern side of Route 22 are located within the 100-year (Zone A) flood zone. This indicates that there is a significant risk of flooding at the subject property. Although, flooding does not specifically represent an environmental risk, the property's location within the flood zone will likely impact and/or restrict its future use and development.

Phase I Environmental Site Assessment, Harlem Valley Psychiatric Center, 73 Wheeler Road, Wingdale, New York, prepared by Advanced Cleanup Technologies, Inc. (ACT) of Hicksville, New York, dated June 4, 2013

The ACT Report was completed in general conformance with ASTM Standard E 1527-05. The scope of the ACT Report investigation included visual reconnaissance of the Subject Property, interviews with knowledgeable persons associated with the Subject Property, review of available regulatory information contained within federal and state environmental databases and other local environmental records, review of the physical characteristics and history of the Subject Property, and a limited physical The following information was presented in the ACT Report:

- At the time of the ACT Report, the Subject Property was improved with 50 institutional and residential buildings and a 937-acre four parcel (7059-00-555750, 7059-00-814768, 7059-00-162702, 7059-00-502949) tract of land.

- This the ACT ESA revealed no evidence of recognized environmental conditions in connection with the subject property, except for the following:

  - Historical landfilling activities at the subject property
  - Historical petroleum storage facilities at the subject property
  - Closed NYSDEC spill numbers associated with the subject property
  - Groundwater contamination beneath the subject property

- The following recommendations were included in the ACT Report:

  - It is likely that the above recognized environmental conditions will be addressed during redevelopment. Therefore, cost-cap or similar insurance coverage should be obtained for all amounts above and beyond projected construction and remedial expenses. These insurance policies are intended to insure against losses well above what was projected. They are appropriate for large development projects requiring extensive environmental remediation as with the subject property.

4.3.10 Dump Site Investigation Reports

Engineering Investigations of Inactive Hazardous Waste Sites in the State of New York, Phase I Investigations, Harlem Valley Psychiatric Center - Dump Site, Town of Dover, Dutchess County, New York, State, prepared by Wehran Engineering, P.C. (Wehran) of Middletown, New York, dated June 1987.

The Wehran Report was conducted under the guidance of the NYSDEC Superfund Program to evaluate the potential environmental or public health hazard associated with past disposal activities at the Harlem Valley Psychiatric Center Dumps. The scope of the Wehran Report investigation included development of a preliminary Hazard Ranking System (HRS) Score. The following information was presented in the Wehran Report:

- According to the Wehran Report, disposal of waste material at Dump # 1 occurred prior to 1968 for the disposal of "non-putrescible" material. According to a September 16, 1966 letter from Lawrence P. Roberts, M.D., former Director of the Center, waste material at Dump # 1 was burned prior to covering with soil.

- According to the Wehran Report, disposal of waste material at Dump # 2 occurred between 1968 and 1975, though evidence at the time of the investigation (1987) suggested the dump was still being used. The dump area is an estimated 2-acre site with two smaller dump areas located to the south and west. The dump area reportedly contains demolition debris, trees, brush, white goods, empty 55-gallon drums and trash.

- Based on HRS scores calculated at each dump site, a Phase II investigation was recommended at both dump sites. Phase II recommendations to address potential groundwater contamination pathways at both dump sites included:

  - Identify and characterize the aquifer of concern.
  - Determine hydraulic gradients between the on-site overburden and the zone of saturation.

- Determine the hydraulic properties of the overburden and bedrock aquifer constituents (permeability, saturated thickness, etc.)
- Determine direction and occurrence of groundwater flow within the immediate area.
- Determine groundwater quality both upgradient and downgradient of the site.
- Identify the potential and existing use of groundwater resources.

- Important Phase II recommendations to address potential surface water contamination pathways at Dump #2 included:

  - Some waste deposition has occurred in the adjacent wetland indicating a potential for surface water contamination. This wetland area is drained to the north by Swamp River.
  - Phase II investigations will include obtaining surface water and sediment samples from the adjacent wetland area and determining if surface water quality has been impacted.

The Phase II Work Plan outlined in the Wehran Report included the following:

- Task 1- Site Reconnaissance/Work Plan
- Task 2- Record Search/Date Compilation
- Task 3- Geophysical Survey/Final Sampling Plan
- Task 4- Drilling and Well Installation (Test borings, monitoring well installation, survey well locations and elevation and field permeability testing)
- Task 5- Sampling (Soil, groundwater, surface water, sediment, leachate, air monitoring)
- Task 6- Phase II Report Preparation
- Task 7- Project Management including Cost Estimation

Engineering Investigations as Inactive Hazardous Waste Sites, Phase II Investigation, Harlem Valley Psychiatric Center, NYS Site Number 314031, Dutchess County, New York, prepared by Engineering-Science, Inc. (ESI) of Liverpool, New York, dated April 1991

- ESI conducted a comprehensive Phase II Investigation to determine whether the two known dump sites have impacted soil, groundwater, surface water and air. The scope of the investigation was summarized in the report as follows, "The Phase II field investigation included an electromagnetic survey to help define the site geologic conditions and to help identify the presence of buried steel drums or conductive contaminant plumes in the subsurface. Seven groundwater monitoring wells were also installed, three at Dump #1 and four at Dump #2. Surface water, groundwater, sediment, soil, and leachate sampling and analysis and air monitoring were conducted to determine whether hazardous substances are present at either of the Harlem Valley Psychiatric Center sites."

Dump Number 1:

- A geophysical investigation conducted in the Dump # 1 area did not indicated the presence of buried drums or significant anomalies attributable to conductive contaminant plumes.

- Three (3) groundwater monitoring wells were installed in the vicinity of Dump # 1. Groundwater depths were observed between 3 and 8 feet below ground surface in the wells. Groundwater and soil samples collected from each of the three boreholes were analyzed for Target Compound List (TCL) organic compounds (volatiles, semi-volatiles, pesticides/PCBs), and Target Analyte List (TAL) metals and cyanide. Results of the soil sampling revealed no concentrations of organic compounds and trace concentrations of metals indicative of naturally occurring levels. Results of the groundwater sampling revealed concentrations of barium, chromium, iron, lead, magnesium and manganese exceeded applicable groundwater standards in the upgradient well.

- Surface water and sediment samples were collected from a marshy area downgradient of the Dump # 1 site. Surface water and sediment samples were analyzed for TCL organic compounds and TAL metals and cyanide. Results of surface water sampling revealed concentrations of aluminum and iron in excess of NYS Class B surface water standards. No concentrations of organic compounds were detected in the sediment samples collected. Concentrations of metals were detected in the sediment samples but within published naturally occurring ranges.

- The Photovac air quality monitoring conducted during the site investigation did not detect volatile organic chemicals in the air or soils at concentrations above background levels.

Dump Number 2:

- A geophysical investigation conducted in the Dump #2 area detected a large anomaly on the northern boundary of the eastern fill area which may indicated buried drums. An anomalous pattern potentially suggesting a contaminant plume was detected along the eastern margin of the dump area.

- Four (4) groundwater monitoring wells were installed in the vicinity of Dump # 1. Groundwater depths were observed between 4 and 15 feet below ground surface in the wells. Groundwater and soil samples collected from each of the four (4) boreholes were analyzed for Target Compound List (TCL) organic compounds (volatiles, semivolatiles, pesticides/PCBs), and Target Analyte List (TAL) metals and cyanide. Results of the soil sampling revealed a concentration of diethylphthalate (semivolatile organic compound) was detected at a low level in an upgradient boring location. No other organic compounds were detected in soil samples. Concentrations of metals were detected but within published naturally occurring ranges. Results of the groundwater sampling revealed concentrations of tetrachloroethene (PCE) in two downgradient wells in excess of the applicable groundwater standard. Low levels of metals contamination were additionally detected in the groundwater samples collected. The contamination appears to correspond to the small conductive plume identified by the geophysical survey. Groundwater samples also indicate low levels of metals contamination. The highest concentrations of most of the metals were in upgradient sample GW-1, suggesting a possible off-site source.

- Surface water and sediment samples were collected from a marshy area and stream downgradient of the Dump # 2 site. Surface water and sediment samples were analyzed for TCL organic compounds and TAL metals and cyanide. Bis(2-ethylhexyl)phthalate was detected above the NYS Class A surface water standard. Iron and manganese were detected above applicable standards in two sampling locations. Two volatile organic compounds, trichloroethene (TCE) and PCE, were detected in sediment sample SED-4. PCE was also detected in two downgradient groundwater samples from Dump #2, but was not detected in the surface water samples. The concentrations of metals in the sediment samples were within the published naturally-occurring ranges for New York State soils. No apparent metals contamination is indicated in the sediment samples.

- One leachate sample was collected from a seep along the road north of the western fill area. The leachate sample was analyzed for TCL organic compounds and TAL metals and cyanide. The concentrations of three metals, iron, lead, and manganese exceeded the NYS groundwater standards and Class A surface water standards.

- The Photovac air quality monitoring conducted during the site investigation did not detect volatile organic chemicals in the air or soils at concentrations above background levels.

Recommendations:

- The Phase II investigation at the Harlem Valley Psychiatric Center Dump #1 and Dump #2 sites was intended to determine whether there was documentation of hazardous waste disposal and whether the landfill areas were contaminated, adversely impacting groundwater and surface water quality in the site vicinity. In general, the scope of the Phase II investigation was adequate to provide the site contamination assessment.

- There is no documentation of hazardous waste disposal in either Dump #1 or Dump #2. There are fuel tanks, partially filled drums, and lead-acid batteries stored at Dump #2. There is evidence of minor contamination being released to the groundwater and surface water from Dump #1 and Dump #2. If the site does not warrant listing as an inactive hazardous waste site, the recommended course of action is a closure of both landfill sites in accordance with 6NYCRR Part 360 requirements.

- Additional investigations may be warranted upgradient of both sites to determine the source of the metals contamination in the upgradient wells. Geophysical (electromagnetic) surveys over the upgradient areas for the two dumps may help identify whether conductive contaminant plumes are present, and whether the plumes are originating from the fill areas (via radial flow), or from some other offsite source.

- The partially-filled drums should be sampled and analyzed for waste characteristics and Extraction Procedure Toxicity (EP-Tox) or Toxicity Characteristic Leaching Procedures (TCLP) to determine whether the liquids are hazardous wastes. The lead-acid batteries and used fuel tanks should be removed from the site because they pose potential direct contact and fire/explosion threats.

New York State Department of Environmental Conservation (NYSDEC) Letter Correspondence, RE DEC Site No 314031, Harlem Valley Psychiatric Center, Route 22, Wingdale, New York, dated September 10, 1991

The NYSDEC letter indicates that the site was previously identified in the Registry of Inactive Hazardous Waste Disposal Sites. According to the Inactive Hazardous Waste Disposal Report included in the letter, several small dumps were located on the property of the Harlem Valley Psychiatric Center, each of which covered less than one acre. Dump #1 was used for disposal of furnace ash, Dump #2 was used for disposal of equipment, and a third dumping area was used for hospital wastes and sewage sludge, with one small sludge pit at the top of the hill. The Hazardous Waste Disposal Report indicates that an EPA Site Investigation, a Phase I Investigation and a Phase II Investigation had been previously completed and, based on these investigations, there was no record of hazardous waste disposal at the site. The letter report was prepared to notify Harlem Valley Psychiatric Center that the NYSDEC had not identified any hazardous wastes at the site. Therefore, the letter constituted notification of deletion of the site from the Registry of Inactive Hazardous Waste Disposal Sites in New York State. The letter indicated that the site would not appear in future registries, unless additional information was brought the attention of the NYSDEC that justified relisting of the site.

Letter Re: Harlem Valley Psychiatric Center May 18, 2001 Inspection, from New York State Department of Environmental Conservation (NYS DEC) to Scott Bard, New York State Office of Mental Health (NYS OMH), dated May 21, 2001

- EBI reviewed the May 2001 letter from NYS DEC which indicates that on-site inspections were performed at the Harlem Valley Psychiatric Center at the request of NYS OMH. NYS DEC inspected Dump #1 (the off-site dump) and Dump #2 along with Dump #2a.
    - Dump #1 – "Based on field observations vegetation on the landfill is well established and no leachate seeps were observed. During the inspection a few 55-gallon drums were observed. OMH should inspect these drums to determine if they contain any waste materials. If any waste materials are encountered, than a full waste characterization should be conducted to determine how to properly manage the waste materials. Please also remove any exposed pieces of scrap metal and recycle it in accordance with State and Federal regulation. Scott Bard of OMH verbally agreed to remove and properly manage the exposed drums and other metal debris during the site inspection.
    - Dump #2 and #2a – "Based on field observations, the waste mass is generally well covered. The vegetation is well established and no leachate seeps were observed. There was a minor amount of exposed roofing material and tires disposed of along the northwestern portion of the site. In addition, east of the dump is a disposal area not reported in the Phase II Investigation. The disposal area is called Dump 2a and it was identified as the Golf Course Landfill in the DEC's 2000 correspondence regarding the facility. This landfill appears to be unrelated to Dump Two and may be a result of unauthorized dumping."
- Additionally, this letter indicates that NYS OMH had agreed to conduct several response actions including:
    - Remove the exposed tires, roofing materials located in Dump 2. In addition, please remove and properly manage the three exposed compressed gas cylinders located south of the garage.
    - Remove all disposed of solid waste in Dump 2a except for brush, concrete, brick, rock and uncontaminated soil.
    - The Phase II Investigation detected elevated concentrations of tetrachloroethene (PCE) in monitoring wells GW-3 and GW-4. Please evaluate the current ground water quality at these locations by sampling these wells for the baseline suite of parameters listed in 6NYCRR § 360-2.11 (d)(6).
    - Incorporate a provision in the property deed clearly indicating the extent of Dump Two. The period of time the landfill accepted wastes, and the types of waste in the landfill This provision should be filed with the Westchester County Clerk.
    - Provide a summary report of the cleanup activities at Dumps One, Two and 2a.

No additional correspondence or documentation was available concerning the above actions, with the exception of the below letter regarding Dump #1.

Letter Re: Former Harlem Valley Psychiatric Center Dump 1, from New York State Department of Environmental Conservation (NYS DEC) to Kenneth Lutters, New York State New York State Office of Parks Recreation & Historic Preservation (OPRHP), dated December 21, 2004

- EBI reviewed a letter dated December 21, 2004 from NYS DEC to Kenneth Lutters of NYS OPRHP, with the results of an inspection performed on December 17, 2004. The inspection was to determine whether the drum and scrap metal removal activities at Dump #1 requested by the Department on May 21, 2001 had been completed. The inspection indicated that the drum and metal debris were removed, however, the landfill had been used by ATV riders since the DEC' s previous site inspection on May 18, 2001, and the ATV traffic had exposed a significant portion of the relatively flat upper surface of the landfill. The letter indicates that DEC was concerned about exposure of ATV riders or any other area users to the exposed ash and landfill debris. DEC requested a report documenting measures taken to reduce public contact with exposed waste materials by a deadline of May 23, 2005.

- No additional documentation was available regarding the above inspection letter or measures taken following this date.

4.3.11 Ash Landfill Reports

Report On Hydrogeologic Investigation, Harlem Valley Psychiatric Center, Wingdale, New York prepared by Holzmacher, McLendon & Murrell, P.C. (H2M Associates) of Melville, New York, dated February 1991

H2M completed a hydrogeological investigation for the site to comply with Consent Order #3-1520-88-05. H2M summarized the investigation as follows:

- "The scope of work included the installation of numerous soil borings, test pits and groundwater monitoring wells. The field study included the extensive sampling and laboratory analysis of soil, surface water and groundwater media. These samples were analyzed for fingerprint characteristics of the potential contaminants associated with long-term coal and ash storage.

- "A total of twelve monitoring wells were installed and sampled in addition to surface water sampling and soil sampling at monitoring well boreholes, supplemental boring locations and localized test pits."

- Groundwater flow was measured to be to the northwest toward Swamp River.

- Investigation indicated some localized inorganic impact (primarily sulfates) in the unsaturated zone onsite at areas directly adjacent to historic coal and ash storage. Limited surface water impact was evident only directly downstream of the remaining coal pile. Additionally, only monitoring wells in close proximity to the current coal pile reported elevated inorganic compounds (primarily sulfates).

- H2M notes a limited area with oil and grease impacts adjacent to the Swamp River, west of the southern portion of Building 34, reported to be due to an area of known discharge of an improperly functioning oil-water separator. The source of this impact related to previous facility discharges was reportedly eliminated through the capping of the discharge line.

  H2M concludes that impacts to soil, groundwater, and surface water were localized, and that remedial actions should be conducted mainly to minimize leachate generated in the future from coal and ash storage. H2M recommends the installation of a 1-foot thick impermeable cap followed by asphalt surface, as well as the containerization of the active coal pile at the site. At the time of the H2M Hydrogeological report the Power Plant was still in use.

Delineation of the Ash North of Wheeler Road and Groundwater Sampling of Existing Monitoring Wells, Harlem Valley Psychiatric Center, Wingdale, New York, letter prepared by Holzmacher, McLendon & Murrell, P.C. (H2M Associates) of Melville, New York, dated March 30, 1992

EBI reviewed a letter written by H2M Associates addressed to Mr. William Sellner, Development Administrator at the New York State Facilities Development Corp., which was provided by the New York State Department of Environmental Conservation (NYS DEC) Region 3 Office/Solid Waste Program. The letter report documents the delineation of the ash located north of Wheeler Road at the Harlem Valley Psychiatric Center, and was written as part of work to comply with Consent Order #3-1520-88-05.

- In February 1992, H2M conducted a visual inspection in the ash pile area north of Wheeler Road to determine the approximate horizontal extent of the ash, following which time ten (10) soil borings were advanced using a hollow stem auger. Borings were advanced beyond the vertical extent of the ash in each of the six (6) borings where ash was present. Ash was observed at a maximum depth of 7.5 feet bgs. Soil samples were collected from the ash/native soil interface in each of the six (6) borings where ash was observed, and samples were analyzed for select inorganic compounds that were quantified as elevated in the previous hydrogeologic investigation conducted in early 1989, including aluminum, iron, magnesium and sulfate.

- The letter report indicated that "the horizontal extent of the ash is limited to an area along the Swamp River. Except for two isolated locations (Figure 1), the depth of the ash does not exceed five feet and is typically less than that. As indicated in Table 2, no ash was present in borings B-7, B-9 or B-10." Additionally, H2M indicated that in comparing analytical results collected at the ash/native fill interface to typical concentrations of the parameters in native soil, "all of the inorganic parameters quantified were either well below or within the range of the comparative standards of typical or average regional soils," with the exception of elevated levels of magnesium, and one elevated level of lead.

- H2M additionally collected groundwater samples to provide a baseline for planned continued monitoring proposed as part of the Proposed Closure Investigation Plan (PCIP). Groundwater samples were taken from existing monitoring wells located on both the north and south sides of Wheeler Road. H2M compared to New York State Standards for Groundwater, 6NYCRR Part 703.5 and the Federal Drinking Water Maximum Contaminant Level (MCL) for Drinking Water, and indicated the following:

    - "Iron exceeded the standards in well numbers MW-S-1, MW-S-2, MW-S-3, MW-S-4, MW-S-7, MW-S-8, MW-R-4, and MW-R-9. Manganese exceeded the state standard in only MW-S-4 and the stricter Federal standard in wells MW-S-2, MW-S-3, MW-S-4, MW-S-7 and MW-R-4. It should be noted that the standards for both iron and manganese are secondary standards based on aesthetics and not health related issues. Sulfate, also compared to a secondary standard, was elevated in wells MW-S-4 and MW-R-9. The highest concentrations of iron, manganese and sulfate were measured in wells located in close proximity to an existing coal pile and in the area of historic coal storage.

- H2M concludes the following:
    - "Ash is present in limited quantities and that typically the depth of the ash is less than five feet."
    - "Only magnesium was detected above available regional metal values for native soils."

- "The results of the groundwater monitoring wells located north of Wheeler Road indicate only slightly elevated iron and manganese levels."

- H2M concludes that the impact from ash located to the north of Wheeler Road is not significant.

Closure Investigation Report for Ash North of Wheeler Road, Harlem Valley Psychiatric Center, Wingdale, New York, prepared by Holzmacher, McLendon & Murrell, P.C. (H2M Associates) of Melville, New York, dated October 1992

- At the request of the NYSDEC, H2M developed a Closure Investigation Plan (CIR) for the ash landfill area north of Wheeler Road to determine:

  - Location of public and private wells
  - All sampling results
  - Effect on the environment
  - Contingency plan for sensitive areas such as wetland and floodplains

- During the hydrogeologic investigation soil, groundwater and surface water samples were collected and submitted for analysis to determine the impact due to the long term storage of ash and coal.

Results of the Investigation:

The following excerpts are taken directly from the H2M *Closure Investigation Report for Ash North of Wheeler Road:*

- The results of these investigations indicate that the soil, groundwater and surface water in proximity to the ash storage areas have been locally impacted by sulfates and, to a lesser degree, by select inorganic compounds. The impacts, although present, are quite limited especially in the vicinity of the ash storage north of Wheeler Road. The analytical testing showed that only magnesium was detected above available regional metal values for native soils. The results of the groundwater monitoring wells located north of Wheeler Road indicate only slightly elevated iron and manganese levels.

- The primary exposure pathway can be predicted to be through the ingestion of impacted surface water or impacted groundwater at private wells. Some private wells are used approximately 400 feet to the northwest of the facility. As the Swamp River is a hydraulic divide for groundwater, any impacted groundwater emanating from the Harlem Valley Psychiatric center site should not have an impact on private wells either upgradient or on the other side of the river. As evidenced by the data presented in this report, only very limited localized inorganic impact is present in the surface waters. The surface water is naturally elevated above the surface water standards and must be treated prior to dilution with reservoir water. Additionally, the water intake for the facility is located in an upstream location and will not be impacted by the localized elevated inorganics present.

Proposed Remediation:

- The proposed remediation for the ash storage area north of Wheeler Road was approved by the NYSDEC and consists of the complete removal of the ash. Since the extent of the ash is not as great as the area south of Wheeler Road, and since it does not comprise the banks of the Swamp River, it is anticipated that excavation will be completed without the need for erosion control along the river. Once the ash has been excavated, the area will be restored to grade through re-grading of existing material and through the use of clean fill. Either the ash will be used by an adjacent

municipality, with NYSDEC approval, or the ash will be disposed of in a Part 360 landfill approved by the NYSDEC. If the ash is landfilled, transportation of the ash will comply with NYSDEC Part 364 transportation guidelines.

Closure Investigation Report for Ash Storage Area South of Wheeler Road, Harlem Valley Psychiatric Center, Wingdale, New York, prepared by Holzmacher, McLendon & Murrell, P.C. (H2M Associates) of Melville, New York, dated October 1992

At the request of the NYSDEC, H2M developed a Closure Investigation Plan (CIR) for the ash landfill area south of Wheeler Road to determine:

- Location of public and private wells
- All sampling results
- Analysis of waste from trenching
- Effect on the environment
- Contingency plan for sensitive areas such as wetland and floodplains

- During the hydrogeologic investigation soil, groundwater and surface water samples were collected and submitted for analysis to determine the impact due to the long term storage of ash and coal.

- The results of the hydrogeologic investigation indicate that the soil, groundwater and surface water in proximity to the power plant area at the Harlem Valley Psychiatric Center have been locally impacted by sulfates and to a lesser degree by select inorganic compounds emanating from historic coal and boiler ash storage. Analytical testing of the ash indicates the potential for only minimal leachability of inorganic compounds (with the exception of sulfates), with concentrations well below the characteristically hazardous threshold established by EPA. As a result, boiler ash comprising the surficial material in low lying areas has resulted in only a limited impact and the discoloration of an adjacent drainage culvert. The limited impact was predominantly present in areas located in close proximity to the current coal storage area. This discoloration was determined to be due to the precipitation of inorganic compounds (predominantly iron) leaching out of the boiler ash deposits.

  As part of this investigation, as assessment was made of the primary pathways of contaminant migration. The primary pathway and matrix of contaminant travel is projected to be through groundwater flow to its ultimate discharge source, the Swamp River.

  The primary exposure is predicted to be through ingestion of impacted surface water or groundwater at private wells. Some private wells are used approximately 400 feet to the northwest of the facility. As the Swamp River is a hydraulic divide for groundwater, any impacted groundwater emanating from the site will discharge to the river and should not impact either the private wells river. As located upgradient or on evidenced by the data the other side of the collected during the investigations, only limited present in the surface water. localized inorganic impact is The surface water is naturally elevated above the surface water standards and must be treated prior to dilution with reservoir water. Additionally, the water intake for the facility is located in an upstream location and will not be impacted by the localized elevated inorganics present."

Proposed Remediation:

The following excerpts are taken directly from the H2M *Closure Investigation Report for Ash Storage Area South of Wheeler Road:*

- The proposed remediation for the ash storage area south of Wheeler was approved by NYSDEC and consists of the complete removal of the ash including all ash in contact with the groundwater. Since the ash comprises the bank of the Swamp River, particular attention will be required during ash removal to provide a temporary impermeable bank along the river. The following procedure is proposed for the ash removal south of Wheeler Road and for restoration of the site.

  Prior to the excavation of the ash, sheet piling may be installed along the Swamp River on the west side of the site as required to facilitate dewatering and site stabilization. This sheeting would serve as a boundary for the excavation and a temporary impermeable bank for the river. Subsurface investigations and recent site inspections indicate that the ash to be removed may extend into the bank areas of both the Swamp River on the west and the drainage swale on the south. Personnel from the NYSDEC will be consulted with regard to the exact limits of removal within the wetland area that is adjacent to the river.

  The sheeting would serve to prevent direct inflow from the Swamp River and to facilitate dewatering within the excavation. Discharge from dewatering operations would be into the Swamp River. NYSDEC will be contacted as to the required permits, specifically a SPDES permit. Soil erosion and sediment control elements will be utilized as necessary to prevent sediment from entering the Swamp River. The ash will be completely excavated and disposed of offsite by a contractor. Disposal will be either to an adjoining municipality for road traction material, per NYSDEC approval, or to a landfill as per NYSDEC regulations for waste disposal. If a third option is available, prior approval will be obtained from NYSDEC. Visual inspection of the bottom of the excavation will be used to determine that all the ash has been removed. The excavated area will then be backfilled with a clean, granular compaction fill to pre-existing grades. Backfill operations will be monitored to ensure specified placement and compaction is achieved.

  If physically possible, the original bank geometry of the Swamp River will be restored and stabilized through the controlled placement topsoil and selected existing slopes are of clean fill, erosion control wetland vegetation. However, too steep to be re-established matting, if the without structural measures, a gabion wall will be constructed to stabilize the bank and eliminate the possibility for erosion. The clean backfill material will extend to the gabion wall allowing groundwater to continue to be hydraulically connected to the river. The sheet piling will be removed upon completion of backfill operations and bank restoration.

  Along the bank of the Swamp River a "wetland" fringe was observed along the south side of Wheeler Road. The National Wetland Inventory Maps (Dover Plains, NY-Conn) categorize swamp River as R2UBHx (R Riverine, 2 Lower Perennial, UB Unconsolidated Bottom, Hx Permanently Flooded Excavated). Several pockets of forested and emergent wetlands are south of the remediation area, or "up river", some 500 feet. Swamp River flows northerly. Down river, little to no permanent emergent marsh is found for several miles. Most of the river bank is unclassified or classified as upland. Stands of deciduous wetland forest reach the river bank approximately 3500 feet north of the project area. The federal classification of being an excavated channel continues northerly to Wingdale. In the vicinity of the site the Swamp River is classified as a Class A river by NYSDEC due to the location of the potable water intake wells located upstream.

  Classification of the wetland fringe, pursuant to 6 NYCRR 664.6 would appear to be best suited for a Class III wetland. This is based on the types of vegetation observed by H2M during a site investigation.

H2M is in contact with the NYSDEC Department of Legal Affairs and the Bureau of Fish and Wildlife, as well as the U.S. Army Corps of Engineers. These agencies will be solicited for technical input with respect to stabilization, protection and restoration of the wetlands which may be affected by this action.

The project sponsor is proposing standard engineering practices to safeguard wetland quality. This would include pretreatment of discharge from dewatering, prevention of the transport of erosional sediment and suspended solids during excavation and remediation by placement of stacked hay-bales, silt sediment screens and floating booms.

During the closure plan phase, H2M will prepare plan details demonstrating the preventive and restorative aspects concerning wetland issues for NYSDEC and USACOE review and/or approval.

Letter Re: Harlem Valley Psychiatric Center, from New York State Department of Environmental Conservation (NYS DEC) to Scott Bard, New York State Office of Mental Health (NYS OMH), dated January 5, 2001

- EBI reviewed the January 2001 letter from NYS DEC, which indicated acceptance of a report titled "Harlem Valley Psychiatric Center Coal Ash Removal Report," which is referenced as dated December 27, 2001 (EBI believes the date to have been in 2000 based on the date of the letter). The DEC letter indicates that an inspection of the ash landfill on November 30, 2000 did not identify coal ash or solid waste at the landfill, and indicated improvement in the condition of the Swamp River. DEC states that the Removal Report indicates "all of the coal ash landfill has been removed and properly disposed of off-site in accordance with applicable plans and contracts. The DEC accepts the Report. Based on a file review and site inspection the DEC has determined that OMH has complied with the Consent Order schedule of compliance requirements."

4.3.11 Wastewater Permitting

New York State Department of Environmental Conservation (NYSDEC) Consent Order, Case #R31520-88-05, dated September 9, 1991

- The NYSDEC issued a Consent Order regarding various violations related to wastewater discharges at the Harlem Valley Psychiatric Center. The facility maintained a State Pollutant Discharge Elimination System (SPDES) permit, permit #NY-0032158, for a discharge from its wastewater treatment plant outfall to the Swamp River [Class C(T)]. The Consent Order identified numerous violations related to the SPDES permit and various unpermitted wastewater discharges.

  The Consent Order also included a Schedule of Compliance, which outlined the requirements and necessary corrective actions for the Harlem Valley Psychiatric Center to address the violations. These actions included the elimination of the oil/water separator discharge to the Swamp River, rehabilitation of the sewage treatment plant, elimination or permitting of any and all discharges from the water treatment plant to the tributary of the Swamp River, elimination or permitting of all other non-permitted wastewater discharges, a groundwater investigation, actions to address and control coal pile runoff to the Swamp River, and actions to address on-site boiler ash, including the cessation of on-site boiler ash deposition, the development of a Proposed Closure Investigation Plan to determine the nature and extent of the boiler ash wastes disposed and the type of remediation required for the closure, the submittal of a Closure Investigation Report outlining remediation completed, and closure and post closure monitoring. The Consent Order also required the facility to submit Quarterly Status Reports, summarizing the activities completed during the last quarter and planned for the next quarter for each of the Schedule of Compliance projects identified above.

New York State Department of Environmental Conservation Division of Environmental Permits SPDES Permitting Letter, SPDES No: NY 003 2158, Harlem Valley Psychiatric / NYS Office of Mental Health, Wingdale, New York, dated August 20, 2013

- A letter from the NYSDEDC renewing the State Pollutant Discharge Elimination System (SPDES) permitting for the onsite wastewater treatment plant was issued on August 20, 2012. The current SPDES permit for the Subject Property is valid until October 31, 2017.