Appendix A

Annual Acreage Disturbance Estimates

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1.0 Covered Lands Footprint Defined by Miles Crossed and Acres Encompassed

Covered Lands Footprint Statistics:
Approximately 15,562 miles; 9,783,207 acres; 14 states.

The NiSource on-shore pipeline and storage field system for which NiSource is requesting coverage equals approximately 15,562 miles of linear facilities and twelve counties where potential storage fields most likely to be considered for expansions are found. With these counties and a buffer of one-half mile along the linear facilities, the footprint equates to approximately 9,783,207 acres. Columbia Gas Transmission Company accounts for approximately 77% of the linear transmission footprint. Columbia Gulf Transmission accounts for approximately 22% of the linear transmission footprint; Crossroads accounts for approximately one percent.

2.0 Discussion Related to Storage Fields

NiSource reviewed its competitive and confidentiality responsibilities and requirements relative to the disclosure of storage field location information. Conversations within the Species Team indicate that storage field activities may be recognized differently than pipeline activities. As such, it appears important to accurately reflect the future anticipated work areas for the storage fields.

NiSource has included the county perimeters for twelve counties where the storage fields most likely to be considered for expansion are found. The size of the project covered lands footprint is 9,783,207 million acres with both the one-mile corridor and these twelve counties. See table of "storage field" counties below.

County	**State**
Hocking ; Fairfield; Ashland; Knox; Richland	OH
Bedford	PA
Allegany	MD
Kanawha; Jackson; Preston; Marshall; Wetzel	WV

Refer to Section 4.0 below for quantification of predicted annual maximum disturbance area within these twelve storage field counties.

3.0 Quantification of Predicted Annual and Total Permit Term Direct Disturbance Area within the Covered Land Footprint

NiSource anticipates it will disturb much less than the 9,783,207 acres within the covered lands footprint over the permit term. However, it would be impossible to predict where within the covered lands area the construction, operations, and maintenance activities will be needed in the upcoming 50 years. Notwithstanding, NiSource recognizes the need to quantify the anticipated direct-disturbance area, also

referred to herein as the impact area,[1] in order to allow the Service to proceed with species take analysis. Therefore, NiSource has prepared maximum anticipated projections. Without knowing the future activity location specifics, this acreage projection provides for a reasonable assumption of disturbance coverage within the covered lands footprint.

The tables below tally both permit term (assuming 50 years) and annual disturbance predicted to occur within the covered lands footprint. Of the total anticipated disturbance within the covered lands area, approximately 95 percent of the disturbance would occur on existing rights-of-way (most of this is vegetation maintenance).

The remaining 5 percent represents disturbance for operations and maintenance activities or construction of expansion projects; over the life of the permit this acreage impact would be approximately 42,200 acres within the covered lands area (844 acres annually).

In order to predict annual and total permit term anticipated maximum acreage within the covered lands footprint, NiSource reviewed both historic data and future proposals. As a check of the acres proposed for permit coverage in the tables below, NiSource considered an alternative predictive model as a "reality check." It is reasonable to assume that the "life" of a pipeline is 50 -75 years, requiring full replacement over its lifespan. This alternative model predicts comparable disturbance acreages to those listed in the tables below for operations and maintenance activities.

[1] "Impacted area" in this document refers to the area within the covered lands footprint proposed for direct above-ground or below-ground disturbance by NiSource in order to perform the covered activities (e.g., ROW maintenance, construction of new projects). NiSource recognizes that the project's "action area" may be an area larger than the impact or disturbance area and is species-dependent. This document presents the impact area (synonymous with disturbance area) only and does not consider potential species-specific action areas.

NiSource Maximum Anticipated Disturbance Area Metrics within the Covered Lands Footprint for the TOTAL PERMIT TERM (50 YEARS)

		Pipeline			Storage Field		Compressor Station	
	Total Acreage	Length (miles)	Existing ROW [1] (acres)	New ROW [1] (acres)	Existing ROW (acres)	New ROW (acres)	Existing ROW (acres)	New ROW (acres)
Right-of-way Vegetation Maintenance	833,333	na	833,333	0	incl	incl	incl	incl
% of Overall Covered Lands	*8.52%*		*8.52%*	-				
Operations & Maintenance	55,100	na	52,300	2,800	incl	incl	incl	incl
% of Overall Covered Lands	*0.56%*		*0.53%*	*0.03%*				
Capital Expansion Project - Medium	33,500	2,500	15,150	15,150	0	3,000	200	0
% of Overall Covered Lands	*0.34%*		*0.15%*	*0.15%*	-	*0.03%*	*neglig*	
Capital Expansion Project - Large	48,500	4,000	24,250	24,250	na	na	incl	incl
% of Overall Covered Lands	*0.50%*		*0.25%*	*0.25%*				
PERMIT TERM TOTALS (50 YEARS)	**970,433**	**na**	**925,033**	**42,200**	**0**	**3,000**	**200**	**0**
Percentage of Overall Covered Lands Footprint	***9.92%***	***na***	***9.46%***	***0.43%***	**-**	***0.03%***	***neglig***	**-**

NiSource Maximum Anticipated Disturbance Area Metrics within the Covered Lands Footprint ANNUALLY

		Pipeline			Storage Field		Compressor Station	
	Total Acreage (annual)	Length (miles)	Existing ROW [1] (acres)	New ROW [1] (acres)	Existing ROW (acres)	New ROW (acres)	Existing ROW (acres)	New ROW (acres)
Right-of-way Vegetation Maintenance[A]	13,333	na	13,333	0	incl	incl	incl	incl
Columbia Gas Transmission	10,267		10,267	0	"	"	"	"
mechanical			*7,187*		"	"	"	"
herbicide			*3,080*		"	"	"	"
Columbia Gulf Transmission	2,907		2,907	0	"	"	"	"
mechanical			*291*		"	"	"	"
herbicide			*2,616*		"	"	"	"
Crossroads	160.0		160	0	"	"	"	"
mechanical			*144*		"	"	"	"
herbicide			*16*		"	"	"	"
Design Margin[B] (25%) Sub Total	16,667		16,667	0				
Operations & Maintenance	551	na	523	28	incl	incl	incl	incl
Columbia Gas Transmission	424		403	22	"	"	"	"
Columbia Gulf Transmission	120		114	6	"	"	"	"
Crossroads	7		6	0	"	"	"	"
Design Margin[B] (100%) Sub Total	1,102		1,046	56				
Capital Expansion Project - Medium (occurs every other year)	335	25	152	152	0	30	2	0
Columbia Gas Transmission Pipeline and Storage	265	19	117	117	0	30	2	0
Columbia Gulf Transmission	66	5	33	33	0	0	0	0
Crossroads	4	0	2	2	0	0	0	0
Design Margin[B] (100%) Sub Total	670	50	303	303	0	60	4	
Capital Expansion Project - Large (occurs every fifth year)	485	40	243	243	na	na	incl	incl
Columbia Gas Transmission	373	31	187	187	"	"	"	"
Columbia Gulf Transmission	106	9	53	53	"	"	"	"

		Pipeline			Storage Field		Compressor Station	
Crossroads	6	0	3	3	"	"	"	"
Design Margin[B] (100%) Sub Total	970	80	485	485	"	"	"	"
Totals	**19,409**	**130**	**18,501**	**844**	**0**	**60**	**4**	**0**

Table Notes:

[1] The table heading "Existing ROW" generally indicates the acreage which falls within areas previously disturbed for construction of a right-of-way. The acreage under the table heading "New ROW" represents areas of new disturbance (e.g. tree clearing to build new ROW or other conversion of land use).

[A] ROW vegetation maintenance is split between mechanical and herbicide methods. Acreage is based on 2200 miles of ROW maintained/year. Generally, NiSource will perform some type of ROW maintenance at any given location once every 5 to 7 years.

- The ROW maintenance estimates are an order of magnitude estimate. It is anticipated that detailed ROW maintenance records will be kept for MSHCP implementation and reporting. The current corporate philosophy is to move toward IVM of ROW, however, this is subject to change and NiSource must have the ability to use either mechanical or herbicide to maintain ROW at any given location.

- It is important to note that vegetation maintenance is not required along a significant portion of NiSource's ROW. This is because the current land use is cropland, residential, industrial, etc. The portion of ROW not needing vegetative maintenance is as follows: Columbia Gas Transmission (25%); Columbia Gulf Transmission (40%); and Crossroads (50%). This table does not include acreages for these lands where vegetation maintenance is not required.

[B] Design margin doubles acreage (100%) for O&M and Capital expansion projects; comparably it adds only 25% to ROW maintenance acreage.

Definitions:
"Medium Capital Expansion Projects" are defined as construction of a 50-mile pipeline, drilling of 30 wells, or installation of 4 compressor station additions. [In the year of construction, a well is assumed to impact two acres – approximately a 300' x 300' square; a compressor station is assumed to impact one acre]

Medium capital expansion projects are estimated to occur once every other year. It is estimated there will be 25 medium capital expansion projects over the term of the MSHCP. For acreage impacts in the year of work, multiply the total annual acreage by 2 and then multiple again by 2 to address the design margin. Construction corridor is estimated to average 110 feet wide including use of extra temporary workspaces.

Storage fields expansions are included in the medium capital expansion project numbers. Wells in Ohio are typically spaced 1800 feet apart; wells in other parts of the system are typically spaced 2400 feet apart. If the distance between wells is 1800' and the well area is 300' x 300' the distance between well areas is 1500'. If the distance between wells is 2400' and the well area is 300' square, the distance between well areas is 2100'. The main storage

lines can be larger diameter, so a 75 foot ROW is sometimes needed, but the vast majority of the "spider" or "spaghetti" feeder lines are smaller diameter (e.g. 2, 4, 6, 8-inch, etc.) so 50 foot ROW is the standard, and depending on the lease agreement it is possible to have even smaller ROWs (20 or 30 feet). Figures 2 and 3 in the ECS show these typical ROW layouts. Access roads, if built new, would follow guidance in the ECS: 25-foot wide with extra width at tight turns. If the road is existing, then sidetrimming of branches may be necessary and/or grade/gravel may be necessary for maintenance depending on the project/equipment used. However, once the road is built, the existing width does not typically change.

"Large Capital Expansion Projects" are defined as the construction of a new pipeline 200 miles in length.

Large capital expansion projects are estimated to occur once every five years. It is estimated there will be 10 large capital expansion projects over the term of the MSHCP. For acreage impacts in the year of work, multiply the total annual acreage by 5 and then multiply again by 2 to address the design margin. Construction corridor is estimated to average 100 feet wide including use of extra temporary workspaces.

It is currently anticipated that NiSource would install only one additional loop along most of the system.

"incl" denotes that the acres disclosed under Pipeline include storage field and compressor station acres.

"na" denotes not applicable

4.0 Quantification of Predicted Annual Maximum Disturbance Area within the 12 "Storage Field Counties"

This section attempts to define the bounds of the "worst-case but realistic" potentially impacted acreage in any one of the 12 counties where the covered lands footprint includes the entire county boundary (i.e., "storage field counties"). This acreage impact is made up of storage field activity acres (maximum 120 acres) plus some extent of linear capital project construction activity acres. To predict a worst-case scenario for the linear corridor impact, NiSource assumed a 50-mile project (the longest straight line in any one of our storage field counties). Fifty miles of project equates to approximately 667 acres (of which approximately half would overlap with existing, previously disturbed ROW). With this assumption, the maximum acreage during a single year when a project may occur, would be approximately 787 acres, including both the spider-web storage field activities (120 acres) and linear construction (667 acres). Of this 787 acres, only 454 acres could impact previously undisturbed lands. To put things into perspective, 787 acres is only 0.4% of the total land cover (less than one half of one percent) for the smallest "storage field" county noted above.

Statistics for Covered Lands Counties where Entire County Boundary is Included

Storage Field County (State, County)	Mileage is the longest straight line within the county boundary (approximate and rounded up) (miles)	Acreage in the entire county area coverage (acres)
Ohio		
Hocking	34	271,109.85
Ashland	37	273,177.92
Fairfield	33	325,540.23
Knox	37	338,903.09
Richland	37	320,208.23
Pennsylvania		
Bedford	50	651,064.15
Maryland		
Allegany	43	275,126.08
West Virginia		
Jackson	39	301,823.07
Kanawha	49	583,000.05
Marshall	27	199,813.12
Preston	34	416,882.94
Wetzel	30	231,277.54