APPENDIX G

WATER QUALITY AND QUANTITY IMPACTS

Water Quality

Potential surface water quality impacts were compared between the alignment alternatives using a method developed by AHTD. A system was devised to calculate a stream crossing Water Quality Index (WQI) Rating. Two parameters were determined for each area of stream impact. Each parameter received a relative rating based on the perception of increasing impacts.

USGS Quadrangle maps were used to determine if the stream had intermittent or perennial flow. Intermittent streams received a Flow Rating = 1, and perennial streams received a Flow Rating = 2.

The second parameter concerned the length of the stream that would potentially be impacted by the project, as well as the amount and type of construction that could be taking place in the stream locality. A stream which had a perpendicular crossing by the main lanes received an Impact Area Rating = 1. A stream which had a linear impact by the main lanes received an Impact Area Rating = 2. Streams which would be impacted by both the main lanes and ramps in an interchange area received an Impact Area Rating = 3.

After a determination of these parameters, the following equation was used to determine the WQI Rating.

Flow Rating x Impact Area Rating = WQI Rating

Table G-1 shows a break down of the stream types and impact areas of each stream by alignment alternative. Table G-2 illustrates the average stream WQI ratings by alignment alternative.

Floodplains and Floodways

Table G-3 shows the results of the floodplain and floodway analyses for each alignment alternative.

Table G-1. Water Quality Index values for all streams within the North Belt Project area.

Alignment Alternative	Stream Name	Stream Type	Impact Type	WQI Rating
Common	unnamed tributary to Newton Creek	1	1	1
Common	unnamed tributary to Newton Creek	1	1	1
Common	Five Mile Creek	1	1	1
Common	unnamed tributary to Five Mile Creek	1	1	1
Common	Spring Creek	1	1	1
Common	unnamed tributary to Five Mile Creek	1	1	1
Common	unnamed tributary to Five Mile Creek	1	1	1
Common	unnamed tributary to Five Mile Creek	1	1	1
Common	unnamed tributary to Woodruff Creek	1	1	1
Common	unnamed tributary to Woodruff Creek	1	1	1
Common	Woodruff Creek	1	3	3
Common	unnamed tributary to Woodruff Creek	1	1	1
A	unnamed tributary to Miles Creek	1	1	1
A	Gap Creek	1	2	2
A	Gap Creek	1	2	2
A	Gap Creek	1	2	2
A	unnamed tributary to Gap Creek	1	1	1
A	Gap Creek	1	2	2
A	Gap Creek	2	1	2
A	Kellogg Creek	2	2	4
A	Kellogg Creek	2	2	4
A w/ OSI*	Kellogg Creek	2	3	6
A w/o OSI	Kellogg Creek	2	2	4
A w/ OSI	Kellogg Creek	2	3	6
A w/o OSI	Kellogg Creek	2	2	4
Ab	unnamed tributary to Miles Creek	1	1	1
Ab	Gap Creek	1	2	2
Ab	Gap Creek	1	2	2
Ab	Gap Creek	1	2	2
Ab	unnamed tributary to Gap Creek	1	1	1
Ab	Gap Creek	1	2	2
Ab	Gap Creek	2	1	2
Ab	Kellogg Creek	2	2	4
Ab	Kellogg Creek	2	2	4
Ab w/ OSI	Kellogg Creek	2	3	6
Ab w/o OSI	Kellogg Creek	2	2	4
Ab w/ OSI.	Kellogg Creek	2	3	6
Ab w/o OSI	Kellogg Creek	2	2	4
B	unnamed tributary to Miles Creek	1	2	2
B	unnamed tributary to Miles Creek	1	2	2
B	unnamed tributary to Miles Creek	1	1	1
B	unnamed tributary to Miles Creek	1	1	1

*OSI = Oneida Street Interchange

Table G-1 Continued

Alignment Alternative	Stream Name	Stream Type	Impact Type	WQI Rating
B	unnamed tributary to Kellogg Creek	1	2	2
B	unnamed tributary to Kellogg Creek	1	1	1
B	Gap Creek	2	1	2
B	Kellogg Creek	2	2	4
B	Kellogg Creek	2	2	4
B w/ OSI*	Kellogg Creek	2	3	6
B w/o OSI	Kellogg Creek	2	2	4
B w/ OSI	Kellogg Creek	2	3	6
B w/o OSI	Kellogg Creek	2	2	4
Ba	unnamed tributary to Miles Creek	1	2	2
Ba	unnamed tributary to Miles Creek	1	2	2
Ba	unnamed tributary to Miles Creek	1	1	1
Ba	unnamed tributary to Miles Creek	1	1	1
Ba	unnamed tributary to Miles Creek	1	1	1
Ba	unnamed tributary to Kellogg Creek	1	2	2
Ba	unnamed tributary to Kellogg Creek	1	1	1
Ba	Gap Creek	2	1	2
Ba	Kellogg Creek	2	2	4
Ba	Kellogg Creek	2	2	4
Ba w/ OSI	Kellogg Creek	2	3	6
Ba w/o OSI	Kellogg Creek	2	2	4
Ba w/ OSI	Kellogg Creek	2	3	6
Ba w/o OSI	Kellogg Creek	2	2	4
Bb	unnamed tributary to Miles Creek	1	2	2
Bb	unnamed tributary to Miles Creek	1	2	2
Bb	unnamed tributary to Miles Creek	1	1	1
Bb	unnamed tributary to Miles Creek	1	1	1
Bb	unnamed tributary to Kellogg Creek	1	2	2
Bb	unnamed tributary to Kellogg Creek	1	1	1
Bb	Kellogg Creek	2	2	4
Bb	Kellogg Creek	2	2	4
Bb w/ OSI	Kellogg Creek	2	3	6
Bb w/o OSI	Kellogg Creek	2	2	4
Bb w/ OSI	Kellogg Creek	2	3	6
Bb w/o OSI	Kellogg Creek	2	2	4
Bab	unnamed tributary to Miles Creek	1	2	2
Bab	unnamed tributary to Miles Creek	1	2	2
Bab	unnamed tributary to Miles Creek	1	1	1
Bab	unnamed tributary to Miles Creek	1	1	1
Bab	unnamed tributary to Miles Creek	1	1	1

*OSI = Oneida Street Interchange

Table G-1 Continued

Alignment Alternative	Stream Name	Stream Type	Impact Type	WQI Rating
Bab	unnamed tributary to Kellogg Creek	1	2	2
Bab	unnamed tributary to Kellogg Creek	1	1	1
Bab	Gap Creek	2	1	2
Bab	Kellogg Creek	2	2	4
Bab	Kellogg Creek	2	2	4
Bab w/ OSI*	Kellogg Creek	2	3	6
Bab w/o OSI	Kellogg Creek	2	2	4
Bab w/ OSI	Kellogg Creek	2	3	6
Bab w/o OSI	Kellogg Creek	2	2	4
C	unnamed tributary to Miles Creek	1	2	2
C	unnamed tributary to Miles Creek	1	2	2
C	unnamed tributary to Miles Creek	1	1	1
C	Miles Creek	2	2	4
C	Miles Creek	2	2	4
C	Miles Creek	2	2	4
C	Kellogg Creek	2	2	4
C	unnamed tributary to Kellogg Creek	1	3	3
C	unnamed tributary to Kellogg Creek	1	1	1
C	unnamed tributary to Bayou Meto	2	1	2
C	Bayou Meto	2	1	2
C	Bayou Meto	2	1	2
C	Kellogg Creek	2	2	4
C	Kellogg Creek	2	2	4
C	Kellogg Creek	2	2	4
C	Kellogg Creek	2	2	4
C	Kellogg Creek	2	1	2

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Table G-2

Stream Crossings and Average Water Quality Index Ratings

Alignment Alternative	Stream Crossings	Average WQI Rating
Common	12	1.2
A	11	2.9
A w/o OSI	11	2.5
Ab	11	2.9
Ab w/o OSI	11	2.5
B	11	2.8
B w/o OSI	11	2.5
Ba	12	2.7
Ba w/o OSI	12	2.3
Bb	11	2.8
Bb w/o OSI	11	2.5
Bab	12	2.7
Bab w/o OSI	12	2.3
C	17	2.9

* OSI = Oneida Street Interchange

Table G-3

Floodplain Impacts

Linear Feet (Linear Meters)

Alignment Alternative	Stream	Zone A Floodplain	Regulatory Floodway
Common		0 (0)	0 (0)
A	Kellogg Creek	7,000 (2,133)	0 (0)
A	Kellogg Creek	6,700 (2,042)	0 (0)
A	Bayou Meto/Kellogg Creek	6,000 (1,829)	0 (0)
Total A		**12,700 (3780)**	**0 (0)**
Ab	Kellogg Creek	3,200 (975)	0 (0)
Ab	Kellogg Creek	7,200 (2,194)	0 (0)
Ab	Bayou Meto/Kellogg Creek	6,000 (1,829)	0 (0)
Total Ab		**13,200 (4,023)**	**0 (0)**
B	Unnamed tributary Kellogg Creek	400 (122)	0 (0)
B	Kellogg Creek	6,700 (2,042)	0 (0)
B	Bayou Meto/Kellogg Creek	6,000 (1,829)	0 (0)
Total B		**13,100 (3,993)**	**0 (0)**
Ba	Unnamed tributary Kellogg Creek	400 (122)	0 (0)
Ba	Kellogg Creek	6,700 (2,042)	0 (0)
Ba	Bayou Meto/Kellogg Creek	6,000 (1,829)	0 (0)
Total Ba		**13,100 (3,993)**	**0 (0)**

Table G-3 Continued

Floodplain Impacts

Linear Feet (Linear Meters)

Alternative	Stream	Zone A Floodplain	Regulatory Floodway
Bb	Unnamed tributary Kellogg Creek	400 (122)	0 (0)
Bb	Kellogg Creek	7,200 (2,194)	0 (0)
Bb	Bayou Meto/Kellogg Creek	6,000 (1,829)	0 (0)
Total Bb		**13,600 (4,145)**	**0 (0)**
Bab	Unnamed tributary Kellogg Creek	400 (122)	0 (0)
Bab	Kellogg Creek	7,200 (2,194)	0 (0)
Bab	Bayou Meto/Kellogg Creek	6,000 (1,829)	0 (0)
Total Bab		**13,600 (4,145)**	**0 (0)**
C	Miles Creek	300 (91)	0 (0)
C	Kellogg Creek	3,200 (975)	0 (0)
C	Bayou Meto	400 (122)	0 (0)
C	Bayou Meto	0 (0)	4,000 (1,219)
C	Bayou Meto/Kellogg Creek	5,500 (1,677)	0 (0)
Total C		**9,400 (2,865)**	**4,000 (1,219)**

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