Water Body Feature Name	Water Body Location ID	Description of Water Body at Water Body Location	Water Body (Yes/No)	Distance to Project Location Component (m)	EIS Required (Yes/No)
Ptsebe Trib F	WB77	intermittent/permanent water body, partially channelized, fish observed	**Yes**	WT- >120 AR- >120 **OL- 46** UL- >120 **CA- 38** BU- >120	**Yes**
Ptsebe Trib G	WB76	intermittent/permanent water body, naturalized defined channel, fish observed	**Yes**	WT- >120 AR- >120 **OL- Crossing** UL- >120 **CA- Crossing** BU- >120	**Yes**
Ptsebe Trib H	WB75	intermittent/permanent water body, channelized	**Yes**	WT- >120 AR- >120 **OL- Crossing** UL- >120 **CA- Crossing** BU- >120	**Yes**
Ptsebe Trib I	WB72	intermittent/permanent water body, channelized, flows through agricultural fields	**Yes**	WT- >120 AR- >120 **OL- 16** UL- >120 **CA- Crossing** BU- >120	**Yes**
	WB74		**Yes**	WT- >120 AR- >120 **OL- Crossing** UL- >120 **CA- Crossing** BU- >120	**Yes**
Ptsebe Trib J	WB73	intermittent/permanent water body, channelized, flows along agricultural fields	**Yes**	WT- >120 AR- >120 **OL- 119** UL- >120 **CA- 105** BU- >120	**Yes**
Ptsebe Trib K	WB71	ephemeral, channelized drainage feature through agricultural fields	No	N/A	No
Ptsebe Trib L	WB70	ephemeral, channelized drainage feature through agricultural fields	No	N/A	No
Ptsebe Trib M	WB69	ephemeral, channelized drainage ditch along road	No	N/A	No

Legend

WT- Wind Turbine
AR- Road Access
OL- Overhead Line (transmission line)
UL- Underground Line
CA- Construction Activity (includes crane walk, and staging and disturbance areas)
BU- Building (includes substation and interconnection point)
N/A- Not Applicable

6.2.2 Sydenham River Watershed

6.2.2.1 Sydenham River

The records review identified a total of 7 potential watercourses associated with the Sydenham River drainage area within the project area (NRSI 2012a).

NRSI biologists conducted site investigations on the identified watercourse features and have confirmed that none of these watercourses have characteristics that warrant consideration as a water body. A summary of site conditions associated with all features considered during the site investigation, including distances to project location, is provided in Table 9.

Table 9. Water Body Site Investigations Summary for Adelaide Wind Energy Centre Project Area – Sydenham River

Water Body Feature Name	Water Body Location ID	Description of Water Body at Water Body Location	Water Body (Yes/No)	Distance to Project Location Component (m)	EIS Required (Yes/No)
Stevenson Drain	WB8	ephemeral, swale through agricultural field	No	N/A	No
Sullivan Drain	WB9	ephemeral, swale through agricultural field	No	N/A	No
	WB36	ephemeral, poorly defined channel	No	N/A	No
	WB37	ephemeral, channelized drain	No	N/A	No
	WB66	ephemeral, channelized drain	No	N/A	No

Water Body Feature Name	Water Body Location ID	Description of Water Body at Water Body Location	Water Body (Yes/No)	Distance to Project Location Component (m)	EIS Required (Yes/No)
	WB67	ephemeral, channelized drain	No	N/A	No
Sydenham Trib A	WB13	ephemeral, no water body feature present	No	N/A	No
Dortman's Drain	WB27	ephemeral, no water body feature present	No	N/A	No
Richardson -Early Drain	WB28	ephemeral, no water body feature present	No	N/A	No
Johnson Drain-Branch A	WB52	ephemeral, poorly defined channel	No	N/A	No
Raply Drain	WB53	ephemeral, swale through agricultural field	No	N/A	No
	WB54	ephemeral, swale through agricultural field	No	N/A	No

Legend
WT- Wind Turbine
AR- Road Access
OL- Overhead Line (transmission line)
UL- Underground Line
CA- Construction Activity (includes crane walk, and staging and disturbance areas)
BU- Building (includes substation and interconnection point)
N/A- Not Applicable

6.3 Seepage Areas

No seepage areas were identified through the site investigations.

7.0 Modifications to the Records Review

Results of the site investigation led to the further classification of several potential water bodies as non-water bodies based on the observed site-specific conditions These modifications are discussed further below.

Ausable River drainage area records review identified 9 potential water bodies within the project area (NRSI 2012). Findings of the site investigations confirmed that of these 9 potential water bodies, 2 have been confirmed to have at least some habitat that warrants water body classification and warrant further consideration as part of the Environmental Impact Study. The remaining 7 features have been confirmed to be agricultural swales, temporary drainage, or grassed waterways that do not warrant consideration in the EIS in accordance with the REA Regulation.

Adelaide Creek drainage area records review identified 19 potential water bodies within the project area (NRSI 2012). Findings of the site investigations confirmed that of these 19 potential water bodies, 8 have been confirmed to have at least some habitat that warrants water body classification and warrant further consideration as part of the Environmental Impact Study. The remaining 11 features have been confirmed to be agricultural swales, temporary drainage, or grassed waterways that do not warrant consideration in the EIS in accordance with the REA Regulation.

Mud Creek drainage area records review identified 4 potential water bodies within the project area (NRSI 2012). Findings of the site investigations confirmed that of these 4 potential water bodies, 3 have been confirmed to have at least some habitat that warrants water body classification and warrant further consideration as part of the Environmental Impact Study. The remaining feature has been confirmed to be an agricultural swale that does not warrant consideration in the EIS in accordance with the REA Regulation.

Ptsebe Creek drainage area records review identified 13 potential water bodies within the project area (NRSI 2012). Findings of the site investigations confirmed that of these 13 potential water bodies, 8 have been confirmed to have at least some habitat that

warrants water body classification and further consideration as part of the EIS. The remaining 5 features have been confirmed to be agricultural swales, temporary drainage, or grassed waterways that do not warrant consideration in the EIS in accordance with the REA Regulation.

Sydenham River drainage area records review identified 7 potential water bodies within the project area (NRSI 2012). Findings from the site investigations confirmed that of these 7 potential water bodies, none have been confirmed to have habitat that warrants water body classification; therefore, these features do not require consideration in the EIS as per the REA Regulation.

8.0 Summary of Site Investigation

In accordance with the REA Regulation, NRSI has completed water body site investigations for the proposed Adelaide Wind Energy Centre project area. Site investigations were conducted to confirm the presence/absence of water bodies identified during the records review (NRSI 2012), pinpoint any corrections to features identified during the records review, and document new water bodies not previously identified. Field investigations also focused on the characterization of the identified features. The results of this records review have been summarized in Table 10 below.

Table 10. Summary of Water Body Site investigations for the Adelaide Wind Energy Centre

Criteria	Associated Water Body Features
i. In a water body	Site investigations have confirmed the presence of 19 water bodies overlapping the project area, all of which are within the Ausable River watershed. These overlaps represent proposed crossing locations for access roads, transmission line or cabling. All of these water bodies represent permanent or intermittent watercourses. All of which are designated as warmwater fisheries containing warmwater baitfish species, with exception of the Lenting Drain which is classified as a cool/coldwater system. Each of these potential water bodies will be discussed in detail as part of the Environmental Impact Study.
ii. Within 120 m of the average annual high water mark of a lake, other than a lake trout lake that is at or above development capacity	None
iii. Within 300 m of the average annual high water mark of a lake trout lake that is at or above development capacity	None
iv. Within 120 m of the average annual high water mark of a permanent or intermittent stream	Site investigations have confirmed the presence of 23 water bodies within the project area, all of which are within the Ausable River watershed. Most of these water bodies are designated warmwater fisheries, with the exception of the Lenting Drain which is classified as cool/coldwater system. Each of these water bodies will require the completion of an Environmental Impact Study

Criteria	Associated Water Body Features
iv. Within 120 m of a seepage area	None

9.0 References

Credit Valley Conservation and Toronto Region Conservation. March 2009. Evaluation, Classification and Management of Headwater Drainage Features: Interim Guidelines.

Natural Resource Solutions Inc. April 2012. Adelaide Wind Energy Centre Water Body Report – Records Review. (NRSI 2012)

Ontario Ministry of Natural Resources. 2006. Inland Ontario Lakes Designated for Lake Trout Management. Available at: http://www.ontla.on.ca/library/repository/mon/14000/262222.pdf. Accessed December 9, 2010

Appendix I
Site Investigation Field Notes

NATURAL RESOURCE SOLUTIONS INC.
Aquatic, Terrestrial and Wetland Biologists

HABITAT CHARACTERIZATION

PROJECT (Number & Name): 1230 Adelaide WF
Field Staff: G. MacVeigh
Station: WC #21
Waterbody: unknown trib
Drainage System: Ausable R.
Location in System: @ school rd + egremont
Appr. Reach Length (m):

Site Location:
GPS Datum: NAD83 Easting: 0444916
Zone: 17T Northing: 4761570
Municipality: Strathroy Caradoc
Lot & Concession:

Survey Date: 19 Sept 11
Time Started: 1500
Time Finished: 1515

Weather Conditions:
Wind: 4
Precipitation: rain
Cloud Cover (%): 100

ADJACENT LANDS

Valley
Slope: (Gentle (< 5°)) Moderate (5 - 15°) Steep (> 15°)
Extent of Natural Vegetation (m): (0-10) 10 to 20 20 to 30 30+
Vegetation Type: goldenrod, grasses, herbs

Riparian Zone
Flood Plain - extent of frequent flood (m): (0-10) 10 to 20 20 to 30 30+
Vegetation Type: grasses/herbs very steep banks
Vegetation Density (HML): M-L

Canopy Type: grass Quality and % shade: poor 15%.

Land Use agricultural

Other Notes (groundwater, soils, pools, vegetation, etc.)
- west side recently dug- no veg.
- flowing due to rain

CHANNEL MORPHOLOGY

Channel Width (range (m)): 0.75 - 1.25
Bank Height (range (m)): ——
Bank Slope (degrees from surface of water): 60 - 85°
Bank Vegetation Type: grass, herbs

Gradient (H/M/L): L
Meander/(Straight): slight meanders
Bank Stability: fair
Bank Veg. Density (H/M/L): M-L

CHANNEL SUBSTRATE %

(Clay): 30	(Gravel): 15	Boulder:	(Muck): 20
Silt:	(Pebble): 15	Bedrock:	Detritus:
(Sand): 20	Cobble:	Marl:	Other:

INSTREAM HABITAT AND COVER

Pools: ✓	Undercut Banks:	Boulder/Rock:
Riffles:	Woody Debris:	Cobble: ✓
Backwater:	Vegetation: ✓ (east side)	Other:

INSTREAM VEGETATION

Type (submerg./emerg./floating)	Family/Genus/species	Description/Abundance
	terrestrial grasses	

CODES:

AHP Aquatic Habitat Point	SWI Surface Water Input	SCS Stream Cross Section
AHY Aquatic Habitat Area	GWI Groundwater Input	DOX Dissolved Oxygen Stn
TMP Temp Monitor Stn	CKC Creek Crossing	VSS Visual Survey Stn
FLW Flow Monitor Stn	WEL Well	WQS Water Quality Stn
	CUL Culvert	

FLOW CONDITIONS

Cross-Section	Wetted Width (m)	5 Depths, equally spaced (cm)	Discharge/Pool/Riffle/Run/Notes
1			
2			
3			
4			
5			

WATER QUALITY

Water Temp. (°C): 14	D.O. (ppm): —	pH: —	Visible Characteristics/Other Parameters:
Air Temp. (°C): 10	D.O. (%): —	TDS (ppm): —	murky
Time Taken: 1505	Conductivity (µs/cm): —		
Location Taken: @ crossing			

SITE DRAWING

Include: watercourse and name, flow direction, riffle/pool/run habitat, side tributaries, station location, approx. reach length, channel modifications, adjacent landuse, roads & road names, bridges, culverts, north arrow, etc..

- depths very, nothing greater than .5m
- lots of algae
- culvert 3m wide

* photo 808 – further d/s at
809-810 another crossing
location

PHOTOS TAKEN

Photo #	Description	Photo #	Description
811	- east side (u/s view)		
812	- "		
813	- west side (d/s view)		
814	- " substrate		

GENERAL COMMENTS

Fish observed, unusual conditions, differences from previous site visit, landowner comments, topography, general land use and vegetation, etc.:

no fish observed

NATURAL RESOURCE SOLUTIONS INC.
Aquatic, Terrestrial and Wetland Biologists

HABITAT CHARACTERIZATION

PROJECT (Number & Name): 1230 Adelaide WF
Field Staff: G. MacVeigh
Station: WC #30
Waterbody: unknown trib
Drainage System: Ausable R
Location in System: @ Cuddy Rd
Appr. Reach Length (m):

Site Location:
GPS Datum: NAD83 Easting: 0443282
Zone: 17T Northing: 4764276
Municipality: Strathroy-Caradoc
Lot & Concession:

Survey Date: 19 Sept 11
Time Started: 1418
Time Finished: 1430

Weather Conditions:
Wind: 4 Cloud Cover (%): 100
Precipitation: heavy rain

ADJACENT LANDS

Valley
Slope: (Gentle (< 5°)) Moderate (5 - 15°) Steep (> 15°)
Extent of Natural Vegetation (m): 0-10 10 to 20 20 to 30 30+
Vegetation Type: goldenrod, grasses, herbs, burdock, few shrubs

Riparian Zone
Flood Plain - extent of frequent flood (m): (0-10) 10 to 20 20 to 30 30+
Vegetation Type: grasses, herbs
Vegetation Density (HML): H

Canopy Type: Grasses Quality and % shade: fair - 40%

Land Use agricultural

Other Notes (groundwater, soils, pools, vegetation, etc.)
- flow from along roadside (since its raining)
- flow within channel

CHANNEL MORPHOLOGY

Channel Width (range (m)): .75 - 1.25m
Bank Height (range (m)): .25 - .5
Bank Slope (degrees from surface of water): ~~30~~ 30 - 95
Bank Vegetation Type: grasses, herbs

Gradient (H/M/L): L
(Meander)/Straight:
Bank Stability: fair
Bank Veg. Density (H/M/L): H

CHANNEL SUBSTRATE %

(Clay): 40	(Gravel): 20	Boulder:	(Muck): 5
Silt:	(Pebble): 10	Bedrock:	Detritus:
(Sand): 20	(Cobble): 5	Marl:	Other:

INSTREAM HABITAT AND COVER

Pools: ✓	Undercut Banks:	Boulder/Rock: —
Riffles: —	Woody Debris: —	Cobble: ✓
Backwater: —	Vegetation: ✓ (terrestrial grasses)	Other:

INSTREAM VEGETATION

Type (submerg./emerg./floating)	Family/Genus/species	Description/Abundance

CODES:

AHP Aquatic Habitat Point	SWI Surface Water Input	SCS Stream Cross Section
AHY Aquatic Habitat Area	GWI Groundwater Input	DOX Dissolved Oxygen Stn
TMP Temp Monitor Stn	CKC Creek Crossing	VSS Visual Survey Stn
FLW Flow Monitor Stn	WEL Well	WQS Water Quality Stn
	CUL Culvert	

FLOW CONDITIONS

Cross-Section	Wetted Width (m)	5 Depths, equally spaced (cm)	Discharge/Pool/Riffle/Run/Notes
1			
2			
3			
4			
5			

WATER QUALITY

Water Temp. (°C): 14	D.O. (ppm): —	pH: —	Visible Characteristics/Other Parameters:
Air Temp. (°C): 10	D.O. (%): —	TDS (ppm): —	murky
Time Taken: 1425	Conductivity (µs/cm): —		
Location Taken: @ crossing			

SITE DRAWING

Include: watercourse and name, flow direction, riffle/pool/run habitat, side tributaries, station location, approx. reach length, channel modifications, adjacent landuse, roads & road names, bridges, culverts, north arrow, etc...

- no depths greater than .4m
- murky due to rain + clay
- pot. fish habitat.
- flow less than 1m/s - <1m/min
- box culvert 4m wide
- bankful ~2m

PHOTOS TAKEN

Photo #	Description	Photo #	Description
794	box culvert - d/s view (N side)	799	channel
795	defined channel	800	substrates
796	d/s view	801	d/s view
797	limited tree cover		
798	u/s view		

GENERAL COMMENTS

Fish observed, unusual conditions, differences from previous site visit, landowner comments, topography, general land use and vegetation, etc.:

NATURAL RESOURCE SOLUTIONS INC.
Aquatic, Terrestrial and Wetland Biologists

HABITAT CHARACTERIZATION

PROJECT (Number & Name): 1230 Adelaide WF
Field Staff: G MacVeigh
Station: WC # 34
Waterbody: Adelaide Cr.
Drainage System: Ausable R.
Location in System: @ Cuddy Dr.
Appr. Reach Length (m):

Site Location:
GPS Datum: NAD83 Easting: 0440282
Zone: 17T Northing: 4764300
Municipality: Strathroy-Caradoc
Lot & Concession:

Survey Date: 19 Sept 2011
Time Started: 1310
Time Finished: 1330

Weather Conditions:
Wind: 4 Cloud Cover (%): 100
Precipitation: rain!

ADJACENT LANDS

Valley	Slope: Gentle (< 5°)	Moderate (5 - 15°)	Steep (> 15°)		
	Extent of Natural Vegetation (m)	0-10	10 to 20	20 to 30	30+
	Vegetation Type:	north side: willow, grasses, goldenrod		south side: willow, maple, elm, shrubs, raspberry, goldenrod	
Riparian Zone	Flood Plain - extent of frequent flood (m):	0-10	10 to 20	20 to 30	30+
	Vegetation Type:	goldenrod, grasses, shrubs			
	Vegetation Density (HML):	H			
Canopy	Type: deciduous trees	Quality and % shade:	south side - good 70%	north side - poor 25%	
Land Use	agriculture, farmhouse, cows				
Other Notes	(groundwater, soils, pools, vegetation, etc.) limited flow - ~~also~~ less than 1m/s				

CHANNEL MORPHOLOGY

Channel Width (range (m)): 8 - 12 m
Bank Height (range (m)): .75 - 1.25
Bank Slope (degrees from surface of water): 30 - 80°
Bank Vegetation Type: grasses, herbs

Gradient (H/M/L): L
Meander/Straight: Meander
Bank Stability: Good
Bank Veg. Density (H/M/L): M

CHANNEL SUBSTRATE %

Clay: 30	Gravel: 10	Boulder:	Muck: 10
Silt:	Pebble:	Bedrock:	Detritus: 10
Sand: 20	Cobble: 20	Marl:	Other:

INSTREAM HABITAT AND COVER

Pools: ✓	Undercut Banks: —	Boulder/Rock: ✓
Riffles: —	Woody Debris: ✓	Cobble: ✓
Backwater: —	Vegetation: ✓	Other:

INSTREAM VEGETATION

Type (submerg./emerg./floating)	Family/Genus/species	Description/Abundance
	duckweed sp	abundant along edges

CODES:		
AHP Aquatic Habitat Point	SWI Surface Water Input	SCS Stream Cross Section
AHY Aquatic Habitat Area	GWI Groundwater Input	DOX Dissolved Oxygen Stn
TMP Temp Monitor Stn	CKC Creek Crossing	VSS Visual Survey Stn
FLW Flow Monitor Stn	WEL Well	WQS Water Quality Stn
	CUL Culvert	

FLOW CONDITIONS

Cross-Section	Wetted Width (m)	5 Depths, equally spaced (cm)	Discharge/Pool/Riffle/Run/Notes
1		to deep/murky to estimate	
2			
3		over 1m in places	
4			
5			

WATER QUALITY

Water Temp. (°C): 15	D.O. (ppm): —	pH: —	Visible Characteristics/Other Parameters: murky water
Air Temp. (°C): 11	D.O. (%): —	TDS (ppm): —	
Time Taken: ~~@~~ 1320	Conductivity (µs/cm): —		
Location Taken: @ bridge			

SITE DRAWING

Include: watercourse and name, flow direction, riffle/pool/run habitat, side tributaries, station location, approx. reach length, channel modifications, adjacent landuse, roads & road names, bridges, culverts, north arrow, etc...

substantial creek - fish habitat present
- steep slope on west bank
- erosion present
bankful width - 13 15m

PHOTOS TAKEN

Photo #	Description	Photo #	Description
760	- north side - d/s view	771	- u/s view
767	- "	772	- duckweed
768	- d/s side facing east	773	- u/s side (south) facing east
769	- " " " west	774	- " " " west
770	- murky water - u/s		

GENERAL COMMENTS

Fish observed, unusual conditions, differences from previous site visit, landowner comments, topography, general land use and vegetation, etc.:

no fish observed

NATURAL RESOURCE SOLUTIONS INC.
Aquatic, Terrestrial and Wetland Biologists

HABITAT CHARACTERIZATION

PROJECT (Number & Name): 1230 Adelaide WF
Field Staff: G MacVeigh
Station: WC # 33 - d/s side
Waterbody: unknown
Drainage System: Ausable R.
Location in System: @ Cuddy Dr.
Appr. Reach Length (m):

Site Location:
GPS Datum: NAD83 Easting: 044 1114
Zone: 17T Northing: 4764303
Municipality: Strathroy - Caradoc
Lot & Concession:

Survey Date: 19 Sept 2011
Time Started: 1330
Time Finished: 1347

Weather Conditions:
Wind: 4
Cloud Cover (%): 100
Precipitation: rain

ADJACENT LANDS

Valley
Slope: (Gentle (< 5°)) Moderate (5 - 15°) Steep (> 15°)
Extent of Natural Vegetation (m) (0-10) 10 to 20 20 to 30 30+
Vegetation Type: maple, cedar, spruce, shrubs, goldenrod

Riparian Zone
Flood Plain - extent of frequent flood (m): (0-10) 10 to 20 20 to 30 30+
Vegetation Type: grasses, herbs
Vegetation Density (HML): M

Canopy Type: decid. Quality and % shade: fair 45%

Land Use residential, agricultural

Other Notes (groundwater, soils, pools, vegetation, etc.)
one culvert dry, one culvert w some flow

CHANNEL MORPHOLOGY

Channel Width (range (m)): .50 - 1.0m
Bank Height (range (m)): .25m
Bank Slope (degrees from surface of water): 30-60°
Bank Vegetation Type: grasses, herbs

Gradient (H/M/L): L
Meander (Straight)
Bank Stability: Good
Bank Veg. Density (H/M/L): M

CHANNEL SUBSTRATE %

(Clay) 75	(Gravel) 10	Boulder:	(Muck) 5
Silt:	Pebble:	Bedrock:	Detritus:
(Sand) 5	(Cobble) 5	Marl:	Other:

INSTREAM HABITAT AND COVER

Pools: ✓	Undercut Banks: —	Boulder/Rock: —
Riffles: —	Woody Debris: —	Cobble: ✓
Backwater: —	Vegetation: —	Other:

INSTREAM VEGETATION

Type (submerg./emerg./floating)	Family/Genus/species	Description/Abundance

CODES:

AHP Aquatic Habitat Point	SWI Surface Water Input	SCS Stream Cross Section
AHY Aquatic Habitat Area	GWI Groundwater Input	DOX Dissolved Oxygen Stn
TMP Temp Monitor Stn	CKC Creek Crossing	VSS Visual Survey Stn
FLW Flow Monitor Stn	WEL Well	WQS Water Quality Stn
	CUL Culvert	

FLOW CONDITIONS

Cross-Section	Wetted Width (m)	5 Depths, equally spaced (cm)	Discharge/Pool/Riffle/Run/Notes
1	.75m	.15m	
2			
3			
4			
5			

WATER QUALITY

Water Temp. (°C): 12°	D.O. (ppm): —	pH: —	Visible Characteristics/Other Parameters:
Air Temp. (°C): 10°	D.O (%): —	TDS (ppm): —	murky due to clay/rain
Time Taken: 1340	Conductivity (µs/cm): —		
Location Taken: @ crossing			

SITE DRAWING

Include: watercourse and name, flow direction, riffle/pool/run habitat, side tributaries, station location, approx. reach length, channel modifications, adjacent landuse, roads & road names, bridges, culverts, north arrow, etc..

- defined channel
- low flow less than 1.5m/s
- murky
- fish habitat
- bankful width 1-1.5m

PHOTOS TAKEN

Photo #	Description	Photo #	Description
775	u/s view south side of rd	780	substrates/flow
776	"	781	" "
777	view of culverts d/s side	782	north side - east view
778	d/s side view	783	" " - west view (house)
779	dry culvert		

GENERAL COMMENTS

Fish observed, unusual conditions, differences from previous site visit, landowner comments, topography, general land use and vegetation, etc.:

no fish seen

cat seen :)

NATURAL RESOURCE SOLUTIONS INC.
Aquatic, Terrestrial and Wetland Biologists

HABITAT CHARACTERIZATION

PROJECT (Number & Name): 1230 Adelaide WF
Field Staff: G. MacVeigh
Station: WC #31
Waterbody: unknown
Drainage System: Ausable R
Location in System: @ Cuddy Dr.
Appr. Reach Length (m):

Site Location:
GPS Datum: NAD83 Easting: 0442325
Zone: 17T Northing: 4761483
Municipality: Strathroy-Caradoc
Lot & Concession:

Survey Date: 19 Sept 11
Time Started: 1400
Time Finished: 1416

Weather Conditions:
Wind: 4
Cloud Cover (%): 100
Precipitation: rain (heavy)

ADJACENT LANDS

Valley
Slope: (Gentle (< 5°)) Moderate (5 - 15°) Steep (> 15°)
Extent of Natural Vegetation (m) (0-10) 10 to 20 20 to 30 30+
Vegetation Type: goldenrod, grasses, burdock

Riparian Zone
Flood Plain - extent of frequent flood (m): (0-10) 10 to 20 20 to 30 30+
Vegetation Type: grasses, q rod
Vegetation Density (HML): H - d/s side L - u/s side

Canopy Type: grass Quality and % shade: poor - 10-20%

Land Use agriculture

Other Notes (groundwater, soils, pools, vegetation, etc.)
- u/s side recently dugout

CHANNEL MORPHOLOGY

Channel Width (range (m)): 0.5 - 1.5m
Bank Height (range (m)): .25
Bank Slope (degrees from surface of water): 15 - 45°
Bank Vegetation Type: grasses

Gradient (H/M/L): L
Meander/Straight:
Bank Stability: fair
Bank Veg. Density (H/M/L): M-L

CHANNEL SUBSTRATE %

(Clay) 60	Gravel:	Boulder:	(Muck) 20
Silt:	Pebble:	Bedrock:	Detritus:
(Sand) 20	Cobble:	Marl:	Other:

INSTREAM HABITAT AND COVER

Pools: ✓	Undercut Banks: —	Boulder/Rock: —
Riffles: —	Woody Debris: —	Cobble: —
Backwater: —	Vegetation: ✓	Other: —

INSTREAM VEGETATION

Type (submerg./emerg./floating)	Family/Genus/species	Description/Abundance
	terrestrial grasses	

CODES:

AHP Aquatic Habitat Point	SWI Surface Water Input	SCS Stream Cross Section
AHY Aquatic Habitat Area	GWI Groundwater Input	DOX Dissolved Oxygen Stn
TMP Temp Monitor Stn	CKC Creek Crossing	VSS Visual Survey Stn
FLW Flow Monitor Stn	WEL Well	WQS Water Quality Stn
	CUL Culvert	

FLOW CONDITIONS

Cross-Section	Wetted Width (m)	5 Depths, equally spaced (cm)	Discharge/Pool/Riffle/Run/Notes
1	1.5m	~ .20m	
2			
3			
4			
5			

WATER QUALITY

Water Temp. (°C): 13°C	D.O. (ppm): —	pH: —	Visible Characteristics/Other Parameters:	
Air Temp. (°C): 10	D.O. (%): —	TDS (ppm): —	murky water	
Time Taken: 1410	Conductivity (µs/cm): —			
Location Taken: @ crossing				

SITE DRAWING

Include: watercourse and name, flow direction, riffle/pool/run habitat, side tributaries, station location, approx. reach length, channel modifications, adjacent landuse, roads & road names, bridges, culverts, north arrow, etc...

- recently influenced
- pockets of water d/s side
- grassed further u/s
- bankful 2-2.5 m width .5m deep

PHOTOS TAKEN

Photo #	Description	Photo #	Description
786	u/s view (south side of rd)	791	u/s view
787	d/s view (north " ")	792	culvert u/s
788	shallow pool (less than 10cm) d/s side	793	agriculture area -u/s
789	d/s view		
790	" "		

GENERAL COMMENTS

Fish observed, unusual conditions, differences from previous site visit, landowner comments, topography, general land use and vegetation, etc.:

no fish seen
no aquatic veg

NATURAL RESOURCE SOLUTIONS INC.
Aquatic, Terrestrial and Wetland Biologists

HABITAT CHARACTERIZATION

PROJECT (Number & Name): 1230 Adelaide WF
Field Staff: G. MacVeigh
Station: WC #4
Waterbody: trib to Adelaide Cr
Drainage System: Ausable R.
Location in System: @ Kerwood Rd
Appr. Reach Length (m): 25m

Site Location:
GPS Datum: NAD83 Easting: 0439391
Zone: 17T Northing: 4761462
Municipality: Strathroy - Caradoc
Lot & Concession:

Survey Date: 19 Sept 2011
Time Started: 1210
Time Finished: 1230

Weather Conditions:
Wind: 4
Precipitation: rain
Cloud Cover (%): 100 %

ADJACENT LANDS

Valley	Slope: Gentle (< 5°)	(Moderate (5 - 15°))	Steep (> 15°)		
	Extent of Natural Vegetation (m)	(0-10)	10 to 20	20 to 30	(30+)
	Vegetation Type:	S. Side (east/west) ash, maple, g rod, soybeans			N. Side (east) spruce, goldenrod, decid ash trees
	N. Side (west) 0-10 ash goldenrod				
Riparian Zone	Flood Plain - extent of frequent flood (m):	(0-10)	10 to 20	20 to 30	30+
	Vegetation Type: burdock, goldenrod, aster, grasses				
	Vegetation Density (HML):				
Canopy	Type: east side decid/conif	Quality and % shade: 70%			
	west side grasses	15%			
Land Use	agricultural (east side) farming - cattle				
Other Notes	**(groundwater, soils, pools, vegetation, etc.)** box culvert under road 3m wide, no flow				

CHANNEL MORPHOLOGY

Channel Width (range (m)): 0.5 - ~~2.5m~~ 3.0m
Bank Height (range (m)): .30
Bank Slope (degrees from surface of water): 60 - 90°
Bank Vegetation Type: grasses

Gradient (H/M/L): L
Meander/Straight: straight
Bank Stability: good
Bank Veg. Density (H/M/L): high

CHANNEL SUBSTRATE %

Clay:	(Gravel): 30	(Boulder): 5	(Muck): ~~20~~ 5
(Silt) 10	(Pebble): 10	Bedrock:	Detritus:
(Sand): 60	Cobble:	Marl:	Other:

INSTREAM HABITAT AND COVER

Pools: ✓	Undercut Banks: —	Boulder/Rock: ✓
Riffles: —	Woody Debris: ✓	Cobble: —
Backwater: —	Vegetation: ✓	Other: —

INSTREAM VEGETATION

Type (submerg./emerg./floating)	Family/Genus/species	Description/Abundance
	algae	abundant

CODES:

AHP Aquatic Habitat Point	SWI Surface Water Input	SCS Stream Cross Section
AHY Aquatic Habitat Area	GWI Groundwater Input	DOX Dissolved Oxygen Stn
TMP Temp Monitor Stn	CKC Creek Crossing	VSS Visual Survey Stn
FLW Flow Monitor Stn	WEL Well	WQS Water Quality Stn
	CUL Culvert	

FLOW CONDITIONS

Cross-Section	Wetted Width (m)	5 Depths, equally spaced (cm)	Discharge/Pool/Riffle/Run/Notes
1			
2			
3			
4			
5			

WATER QUALITY

Water Temp. (°C): 11	D.O. (ppm): —	pH: —	Visible Characteristics/Other Parameters:
Air Temp. (°C): 14	D.O. (%): —	TDS (ppm): —	
Time Taken: 1220	Conductivity (µs/cm): —		
Location Taken: @ pool			

SITE DRAWING

Include: watercourse and name, flow direction, riffle/pool/run habitat, side tributaries, station location, approx. reach length, channel modifications, adjacent landuse, roads & road names, bridges, culverts, north arrow, etc...

- large shallow pool d/s of road (east side) 15m length, 3m wide, .25m deep
- channel defined
- no flow - except from tile drain

~~wetted~~ bankful width - 4.5m, .7m depth

west side
water murky
very straight
- no flow
- limited water u/s 20m

PHOTOS TAKEN

Photo #	Description	Photo #	Description
747	d/s east side of Kerwood	753	u/s west side of Kerwood
749	draining soybean field	754	murky water/no flow
750	large shallow pool - east side	755	west side facing south
751	~~north~~ east side facing north	756	west side facing north
752	east side facing south		

GENERAL COMMENTS

Fish observed, unusual conditions, differences from previous site visit, landowner comments, topography, general land use and vegetation, etc.:

no fish observed grass growing in portions of channel

p. 1 of

1230 Adelaide WF
- Aquatics

19 Sept 11
G. MacVeigh

air 16
wind 3

Precip: rain
CC: 100%

[redacted]

WC #4

17T 0439391
4761462

- full assessment
- channelized permant trib to Adelaide Cr
- no flow, tile drains present
- straight grasses present w/in channel
- photos 747 - 756

[redacted]

[redacted]

WC # 34 17T 0440282
4764300

- full assessment
- substantial creek - fish habitat present
- limited flow
- photo's 766 - 774

WC # 33 17T 0441114
4764303

- full assessment on d/s side
- u/s side - corn field
- flow - because of rain
- photo's 775 - 783

1230 Adelaide WF
Sept 19, 2011

G. MacVeigh

[redacted]

• photos 785 - south side

[redacted]

WC # 31

• full assessment 17T 0442325 4764283
• u/s recently dredged
• grassed further u/s
• d/s grassed
• limited pockets of water d/s
• no flow
• photo's 786 - 793

WC # 30

• full assessment 17T 0443282 4764276
• murky, limited flow
• photo's 794 - 801

[redacted]

1230 Adelaide WF

p 4 of
G. MacVeigh

[redacted]

WC # 21

17T 0444916
4761570

- up (north along school road - crosses under culvert)
  17T 0441926
  4762525
  ↳ photo 808 east side
  809 - 810 west side

- west side recently dug out - no plants within channel or on bank
- flow steady through west side
- east side vegetated w grasses, herbs
- culvert 3m wide

photo 811 - east side - culvert, veg
812 - east side (d/s view)
813 - west side d/s view
814 - substrates

1230 Adelaide WF
Sept 19, 2011

G. MacVeigh

WC# 20

IFT 0444905
4760711

- agricultural fields - soya
- no wc noticed
  photo 815 - east side
  816 - west side

[redacted]

[redacted]

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Renewable Energy Water Body Site Investigation

Project (Number & Name): 1051 Bornish
Field Staff: Ryan W. Blair B

Survey Date: 30 May 12
Time Started: 1600
Time Finished: 1610
Weather Conditions:
Temp (°C),Wind, Cloud Cover (%), Precipitation: 3°, wind 4, 100%, Drizzle
Precipitation in Prior 48hrs (mm): Ø

Site # WS+2 - By swamp Drain
Drainage system: Nairn R.
Location in system: Nairn
GPS Location:
Easting: 0450 776
Northing: 4234 397

Channel Dimensions and Morphology
Current stage (low flow/normal flow/high flow): Slow
Est flow rate (L/sec) 1
Channel characteristics (straight/meandering, defined/poorly defined): Straight, defined
Channel Gradient (H/M/L): L
Avg. Wetted Width (m): 5m
Avg Water Depth (m): 0.25
Max. Pool Depth (m): 0.42
Avg. Bankfull Width (m): 5.6
Avg. Bankfull Depth (m): 0.56
Substrate Composition (%) Boulder: Cobble: 5 Gravel: 5 Fines: 90
Channel Morph (%) Flat: 100 Riffle: Run: Pool:
Bank Slope and Stability: 150 100?

In-stream Habitat
In-stream Habitat Features (i.e woody debris): woody debris, veg
In-stream Vegetation: Veg - Terrestrial

Riparian Habitat
Riparian Vegetation: trees
Canopy Cover (% and species): Ø
Adjacent Land Use: Agriculture

Surface Water
Temp (°C): 6
Turbidity (L/M/H): M
Colour:

Photographs	#	Direction Taken	Description	Other Photos
Upstream view	377	N		
Downstream view	378	S		
Channel	379			

General Comments/General Description of Watercourse
Fish observed, unusual conditions, topography, general land use and vegetation, channlized, naturalized, meandering, drainage characteristics etc.

Waterbody (Y/N/Maybe) Discussion: Yes - large size

Water Body Sketch
Include: watercourse name, flow direction, riffle/pool/run habitat, side tributaries,water body identifier, approx. reach length, channel modifications, adjacent landuse, roads & road names, bridges, culverts, north arrow, origin of flow, drainage pattern, lake inlet and outlet location, etc

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Renewable Energy Water Body Site Investigation

Project (Number & Name): 1231 Barnish
Field Staff: Brian W. Blair B.

Survey Date: 30-May-12
Time Started: 340
Time Finished: 350

Weather Conditions:
Temp (°C),Wind, Cloud Cover (%), Precipitation: 4° wind 4, 100CC, 0 precip
Precipitation in Prior 48hrs (mm): 0

Site # WB10
Drainage system: Pasquia Basin
Location in system: W/S of Elgin field

GPS Location: 13T
Easting: 0442178
Northing: 5726394

Channel Dimensions and Morphology
Current stage (low flow/normal flow/high flow): ~~low~~/normal Est. flow rate (L/sec): 5
Channel characteristics (straight/meandering, defined/poorly defined): meandering, defined
Channel Gradient (H/M/L): M
Avg. Wetted Width (m): 0.7 Avg Water Depth (m): 0.08 Max. Pool Depth (m): 0.36
Avg. Bankfull Width (m): 1.0 Avg. Bankfull Depth (m): 0.18
Substrate Composition (%) Boulder: 0 Cobble: 20 Gravel: 30 Fines: 40
Channel Morph (%) Flat: 80 Riffle: 0 Run: 20 Pool: 20
Bank Slope and Stability: 100, good

In-stream Habitat
In-stream Habitat Features (i.e woody debris): undercut banks, snye, woody debris
In-stream Vegetation: T-grass algae

Riparian Habitat
Riparian Vegetation: T-grass, herbs, deciduous trees
Canopy Cover (% and species): 60% deciduous trees
Adjacent Land Use: agriculture

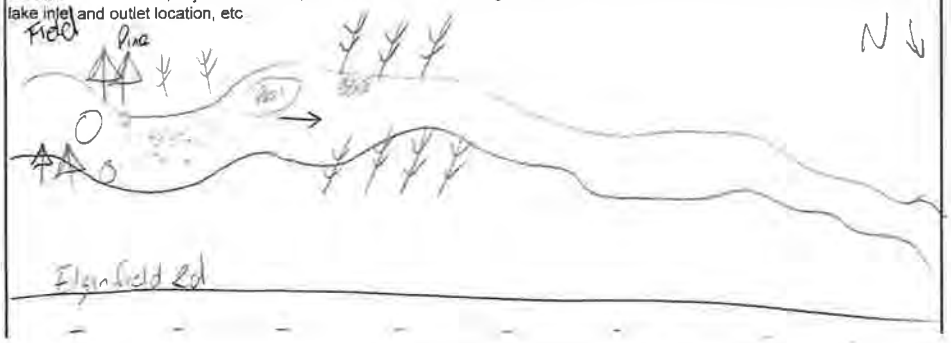
Surface Water
Temp (°C): 5 Turbidity (L/M/H): L Colour: clear

Photographs	#	Direction Taken	Description	Other Photos
Upstream view	374	E		
Downstream view	375	W		
Channel	376			

General Comments/General Description of Watercourse
Fish observed, unusual conditions, topography, general land use and vegetation, channlized, naturalized, meandering, drainage characteristics etc. lots of erosion

Waterbody (Y/N/Maybe) Discussion: Yes, substrate sorting, meandering, flowing slowly

Water Body Sketch
Include: watercourse name, flow direction, riffle/pool/run habitat, side tributaries,water body identifier, approx reach length, channel modifications, adjacent landuse, roads & road names, bridges, culverts, north arrow, origin of flow, drainage pattern, lake inlet and outlet location, etc



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Renewable Energy Water Body Site Investigation

Project (Number & Name): 1231 Bornish
Field Staff: Brian W. Blair R

Survey Date: 30-May-12	**Weather Conditions:**
Time Started: 3:00	Temp (°C),Wind, Cloud Cover (%), Precipitation: 4°, Wind 5, 100% Cloud, 0 precip.
Time Finished: 3:30	Precipitation in Prior 48hrs (mm): 0
Site # WS11	**GPS Location:** 17T
Drainage system: Pringle Dam	Easting: 0441676
Location in system: NW of Elginfield	Northing: 4767831

Channel Dimensions and Morphology
Current stage (low flow/normal flow/high flow): low Est. flow rate (L/sec): 5
Channel characteristics (straight/meandering, defined/poorly defined): meandering, defined
Channel Gradient (H/M/L): L
Avg. Wetted Width (m): 1 Avg Water Depth (m): 0.08 Max. Pool Depth (m): 0.2
Avg. Bankfull Width (m): 3 Avg. Bankfull Depth (m): 0.32
Substrate Composition (%) Boulder: Cobble: 0 Gravel: 30 Fines: 70
Channel Morph (%) Flat: 30 Riffle: 0 Run: 70 Pool: 30
Bank Slope and Stability: 90 fair

In-stream Habitat
In-stream Habitat Features (i.e woody debris): undercut banks
In-stream Vegetation: Filamentous algae (some), Sludge

Riparian Habitat
Riparian Vegetation: grasses, reed, deciduous trees
Canopy Cover (% and species): 30% deciduous trees
Adjacent Land Use: agricultural

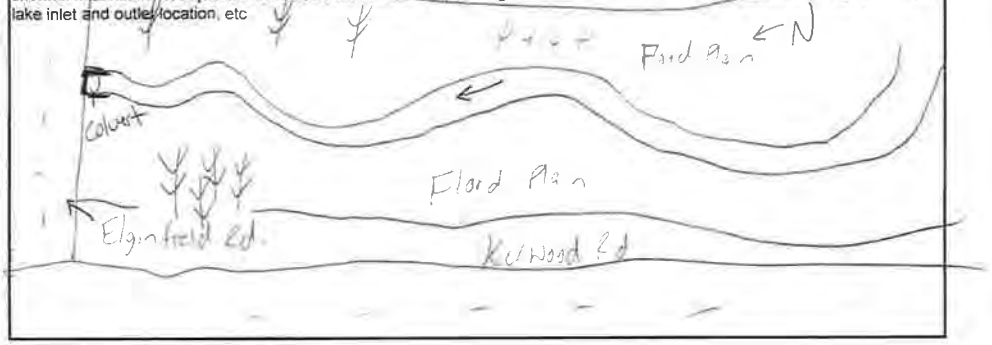
Surface Water
Temp (°C): 7 Turbidity (L/M/H): L Colour: clear

Photographs	**#**	**Direction Taken**	**Description**	**Other Photos**
Upstream view	371	S		
Downstream view	370	N		
Channel	373			

General Comments/General Description of Watercourse
Fish observed, unusual conditions, topography, general land use and vegetation, channlized, naturalized, meandering, drainage characteristics etc.
Connected to flood plain

Waterbody (Y/N/Maybe) Discussion: Yes Substrate Shelving well defined channel very little veg in channel, flowing

Water Body Sketch
Include: watercourse name, flow direction, riffle/pool/run habitat, side tributaries,water body identifier, approx. reach length, channel modifications, adjacent landuse, roads & road names, bridges, culverts, north arrow, origin of flow, drainage pattern, lake inlet and outlet location, etc



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Renewable Energy Water Body Site Investigation

Project (Number & Name): 1230 Adelaide
Field Staff: Brian W. Blair B.

Survey Date: 30-Mar-12
Time Started: 1245
Time Finished: 1310

Weather Conditions:
Temp (°C), Wind, Cloud Cover (%), Precipitation: 7°, wind S, 90%cc, 0 precip
Precipitation in Prior 48hrs (mm): 0

Site # WB 37 - Sullivan Drain
Drainage system:
Location in system: South of Melfort RD

GPS Location: 17T
Easting: 0437484
Northing: 5758329

Channel Dimensions and Morphology

Current stage (low flow/normal flow/high flow): low flow Est. flow rate (L/sec): 0
Channel characteristics (straight/meandering, defined/poorly defined): Meandering, defined (channelized)
Channel Gradient (H/M/L): L
Avg. Wetted Width (m): 1.3 Avg Water Depth (m): 0.45 Max. Pool Depth (m): 0.5
Avg. Bankfull Width (m): 2 Avg. Bankfull Depth (m): 0.4
Substrate Composition (%) Boulder: Cobble: Gravel: 40 Fines: 60
Channel Morph (%) Flat: 100 Riffle: Run: Pool:
Bank Slope and Stability: 150° Good

In-stream Habitat

In-stream Habitat Features (i.e woody debris): Undercut banks, Culvert pool
In-stream Vegetation: T- grasses

Riparian Habitat

Riparian Vegetation: T- grasses, herbs Canopy Cover (% and species): 10, T-grass, herbs, few deciduous
Adjacent Land Use: Agriculture

Surface Water

Temp (°C): 4° Turbidity (L/M/H): L Colour: Clear

Photographs	#	Direction Taken	Description	Other Photos
Upstream view	343	NE		
Downstream view	344	SW		
Channel	345			

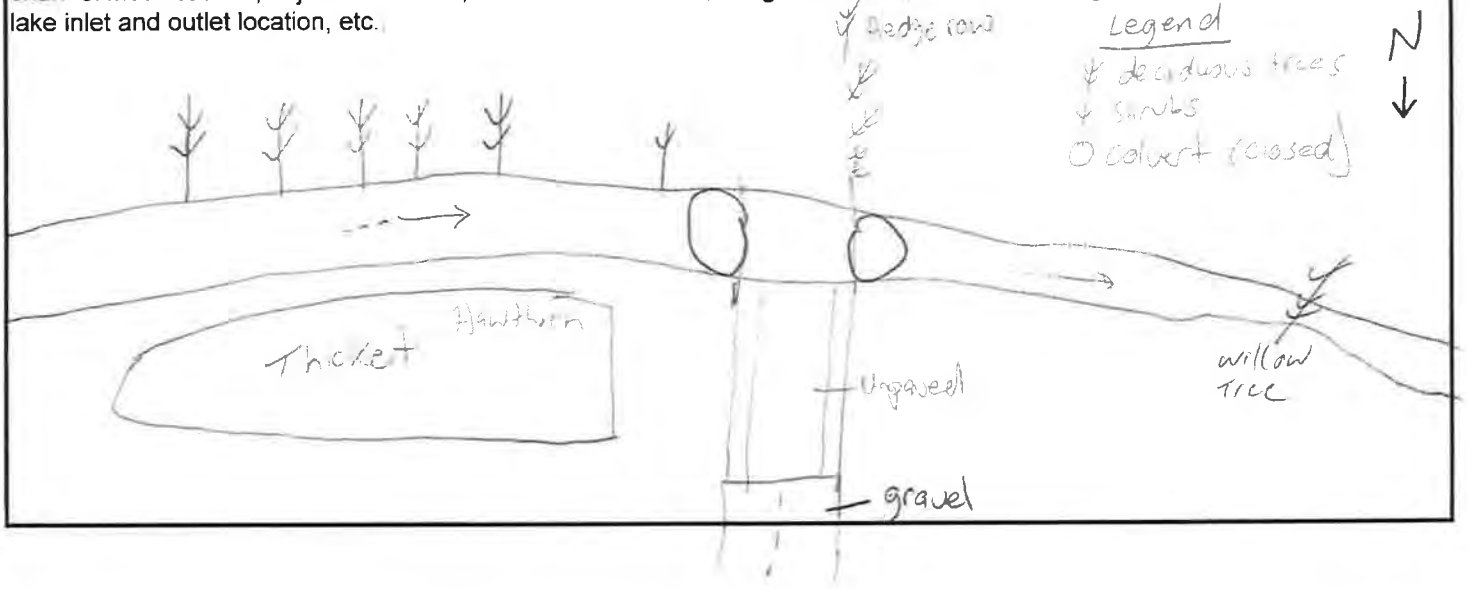
General Comments/General Description of Watercourse

Fish observed, unusual conditions, topography, general land use and vegetation, channlized, naturalized, meandering, drainage characteristics etc.
crayfish observed, surface algae mats
frog observed

Waterbody (Y/N/Maybe) Discussion: NO, no flow, channelized, lack of water d/s.

Water Body Sketch

Include: watercourse name, flow direction, riffle/pool/run habitat, side tributaries, water body identifier, approx. reach length, channel modifications, adjacent landuse, roads & road names, bridges, culverts, north arrow, origin of flow, drainage pattern, lake inlet and outlet location, etc.



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Renewable Energy Water Body Site Investigation

Project (Number & Name): 1230 - Adelaide
Field Staff: Brian W. - Rier B

Survey Date: 30-Mar-12
Time Started: 1330
Time Finished: 1355

Weather Conditions:
Temp (°C), Wind, Cloud Cover (%), Precipitation: 7° wind - 0% cl. 0 precip
Precipitation in Prior 48hrs (mm): 0

Site # WB56 WB55
Drainage system: Seed Drain
Location in system: U/S of Culvert

GPS Location: 17T
Easting: 0447307 E 0445078
Northing: 5762786 5762931

Channel Dimensions and Morphology
Current stage (low flow/normal flow/high flow): —
Est. flow rate (L/sec): —
Channel characteristics (straight/meandering, defined/poorly defined): Underground
Channel Gradient (H/M/L): L
Avg Wetted Width (m): —
Avg Water Depth (m): —
Max Pool Depth (m): —
Avg Bankfull Width (m): —
Avg Bankfull Depth (m): —
Substrate Composition (%) Boulder: — Cobble: — Gravel: — Fines: —
Channel Morph (%) Flat — Riffle — Run — Pool: —
Bank Slope and Stability: —

In-stream Habitat
In-stream Habitat Features (i.e woody debris): —
In-stream Vegetation: —

Riparian Habitat
Riparian Vegetation: —
Canopy Cover (% and species): 0%
Adjacent Land Use: Agriculture

Surface Water
Temp (°C): — Turbidity (L/M/H): — Colour: —

Photographs	#	Direction Taken	Description	Other Photos
Upstream view	350	S		349 D/S inlet
Downstream view	351	N		
Channel				

WB55 → 352 U/S, 353 U/S, 354 inlet

General Comments/General Description of Watercourse
Fish observed, unusual conditions, topography, general land use and vegetation, channlized, naturalized, meandering, drainage characteristics etc.

Underground drainage.

Waterbody (Y/N/Maybe) Discussion: NO

Water Body Sketch
Include: watercourse name, flow direction, riffle/pool/run habitat, side tributaries,water body identifier, approx reach length, channel modifications, adjacent landuse, roads & road names, bridges, culverts, north arrow, origin of flow, drainage pattern, lake inlet and outlet location, etc.

No surface water present

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Renewable Energy Water Body Site Investigation

Project (Number & Name): 1230 Adelaide
Field Staff: R. van W., Blair R.

Survey Date: 30 May 12
Time Started: 1345
Time Finished: 1400

Weather Conditions:
Temp (°C), Wind, Cloud Cover (%), Precipitation: 7° wind 3, 100% ... 8 precip
Precipitation in Prior 48hrs (mm):

Site # WB33
Drainage system: Seeds Drain
Location in system: u/s of Custer Rd

GPS Location: 17T
Easting: 394305
Northing: 4763148

Channel Dimensions and Morphology
Current stage (low flow/normal flow/high flow): low Est. flow rate (L/sec): 5 5
Channel characteristics (straight/meandering, defined/poorly defined): meandering, defined (channelized)
Channel Gradient (H/M/L): L
Avg. Wetted Width (m): 2 5 Avg Water Depth (m): 0 4 5 Max. Pool Depth (m): 0.5α
Avg. Bankfull Width (m): 3 Avg. Bankfull Depth (m): 0.7
Substrate Composition (%) Boulder: Cobble: 5 Gravel: 5 Fines: 90
Channel Morph (%) Flat: 00 Riffle: Run: Pool:
Bank Slope and Stability: 140 good

In-stream Habitat
In-stream Habitat Features (i.e woody debris): very little woody debris, cattails
In-stream Vegetation: cattails

Riparian Habitat
Riparian Vegetation: T. grasses, reed, Canopy Cover (% and species): 5% T. grasses
Adjacent Land Use: Agricultural

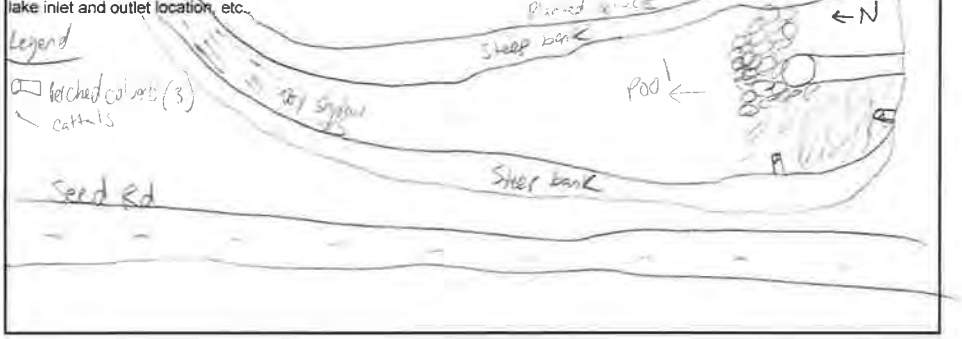
Surface Water
Temp (°C): 10 Turbidity (L/M/H): L Colour: light brown

Photographs	#	Direction Taken	Description	Other Photos
Upstream view	3556	S		
Downstream view	3557	N		
Channel	3559			

General Comments/General Description of Watercourse
Fish observed, unususal conditions, topography, general land use and vegetation, channlized, naturalized, meandering, drainage characteristics etc.
fish observed

Waterbody (Y/N/Maybe) Discussion NO → Low flow, thick weed, channelized drain
poorly defined channel d/s.

Water Body Sketch
Include: watercourse name, flow direction, riffle/pool/run habitat, side tributaries, water body identifier, approx. reach length, channel modifications, adjacent landuse, roads & road names, bridges, culverts, north arrow, origin of flow, drainage pattern, lake inlet and outlet location, etc.



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Renewable Energy Water Body Site Investigation

Project (Number & Name): 1250 - Adelaide
Field Staff: Bran W. Blair R

Survey Date: 30 March-12
Time Started: 1415
Time Finished: 1430

Weather Conditions:
Temp (°C),Wind, Cloud Cover (%), Precipitation: 4° wind 3, 100% sleet/freezing rain
Precipitation in Prior 48hrs (mm): ∅

Site # WB39 (Dodmans Drain)
Drainage system:
Location in system:

GPS Location: 17T
Easting:
Northing:

Channel Dimensions and Morphology
Current stage (low flow/normal flow/high flow): low
Est. flow rate (L/sec): 1
Channel characteristics (straight/meandering, defined/poorly defined): Straight / channelized
Channel Gradient (H/M/L): L
Avg. Wetted Width (m): 1.6 Avg Water Depth (m): 0.25 Max. Pool Depth (m): 0.31
Avg. Bankfull Width (m): 2.4 Avg. Bankfull Depth (m): 0.5
Substrate Composition (%) Boulder: Cobble: 5 Gravel: 10 Fines: 85
Channel Morph (%) Flat: 100 Riffle: Run: Pool:
Bank Slope and Stability: 100° Fair

In-stream Habitat
In-stream Habitat Features (i.e woody debris): Cobble
In-stream Vegetation: N/A

Riparian Habitat
Riparian Vegetation: grasses
Canopy Cover (% and species): ∅%
Adjacent Land Use: agriculture

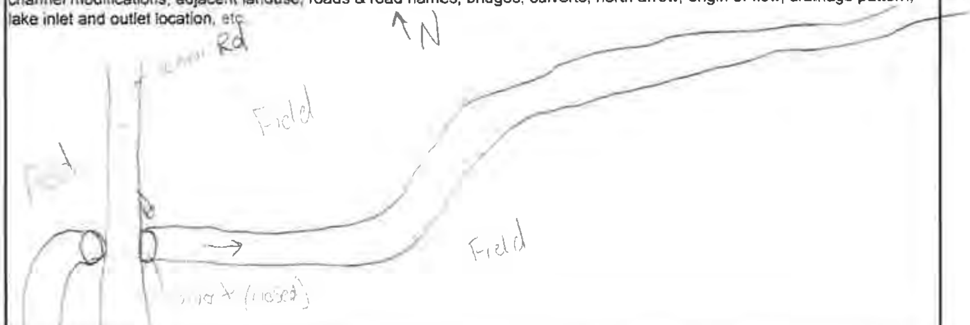
Surface Water
Temp (°C): 6 Turbidity (L/M/H): L Colour: brownish

Photographs	#	Direction Taken	Description	Other Photos
Upstream view	359	W		
Downstream view	360	E		
Channel	361			

General Comments/General Description of Watercourse
Fish observed, unusual conditions, topography, general land use and vegetation, channlized, naturalized, meandering, drainage characteristics etc

Waterbody (Y/N/Maybe) Discussion: No → Ephemeral channelized drainage feature

Water Body Sketch
Include: watercourse name, flow direction, riffle/pool/run habitat, side tributaries,water body identifier, approx reach length, channel modifications, adjacent landuse, roads & road names, bridges, culverts, north arrow, origin of flow, drainage pattern, lake inlet and outlet location, etc



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Renewable Energy Water Body Site Investigation

Project (Number & Name): [illegible]
Field Staff: [illegible]

Survey Date: [illegible]-Mar-12
Time Started: 225
Time Finished:

Weather Conditions:
Temp (°C),Wind, Cloud Cover (%), Precipitation: [illegible]
Precipitation in Prior 48hrs (mm): ∅

Site # [illegible]
Drainage system: [illegible]
Location in system: [illegible]

GPS Location: [illegible]
Easting: [illegible]
Northing: [illegible]

Channel Dimensions and Morphology
Current stage (low flow/normal flow/high flow): low
Est. flow rate (L/sec): L
Channel characteristics (straight/meandering, defined/poorly defined): [illegible]
Channel Gradient (H/M/L): L
Avg. Wetted Width (m): 1 Avg Water Depth (m): 0.09 Max. **Pool Depth** (m): 0.12
Avg. Bankfull Width (m): 1.6 Avg. Bankfull Depth (m): 0.2
Substrate Composition (%) Boulder: Cobble: Gravel: Fines: 100 [illegible]
Channel Morph (%) Flat: 100 Riffle: Run: Pool:
Bank Slope and Stability: 100 good

In-stream Habitat
In-stream Habitat Features (i.e woody debris):
In-stream Vegetation: [illegible]

Riparian Habitat
Riparian Vegetation: [illegible] grasses Canopy Cover (% and species): ∅
Adjacent Land Use: [illegible]

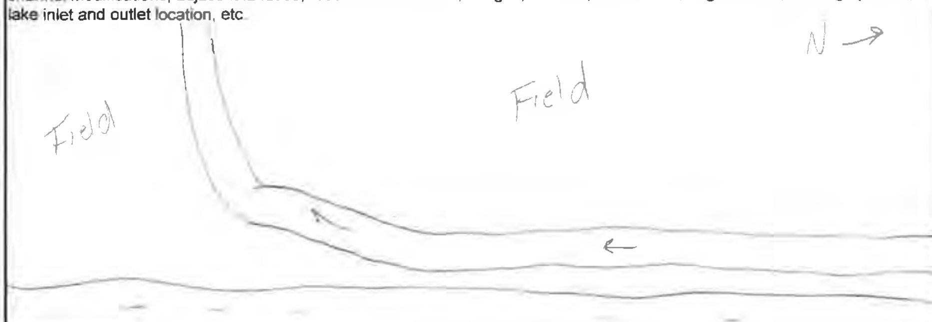
Surface Water
Temp (°C): 5 Turbidity (L/M/H): L Colour: [illegible]

Photographs	#	Direction Taken	Description	Other Photos
Upstream view	362	N		
Downstream view	363	S		
Channel	364			

General Comments/General Description of Watercourse
Fish observed, unusual conditions, topography, general land use and vegetation, channlized, naturalized, meandering, drainage characteristics etc.
Very Channelized

Waterbody (Y/N/Maybe) Discussion: No → [illegible]

Water Body Sketch
Include: watercourse name, flow direction, riffle/pool/run habitat, side tributaries,water body identifier, approx reach length, channel modifications, adjacent landuse, roads & road names, bridges, culverts, north arrow, origin of flow, drainage pattern, lake inlet and outlet location, etc.



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Renewable Energy Water Body Site Investigation

Project (Number & Name): 1270 Adelaide
Field Staff: Brian W. , Blair B.

Survey Date: 30-Mar-12
Time Started: 1450
Time Finished: 1500

Weather Conditions:
Temp (°C),Wind, Cloud Cover (%), Precipitation: 2°, Wind 6, 100 C.C. Ø precip
Precipitation in Prior 48hrs (mm): Ø

Site # WS48
Drainage system: [illegible] Cr
Location in system: [illegible]

GPS Location: 17T
Easting: 0439894
Northing: 4758889

Channel Dimensions and Morphology
Current stage (low flow/normal flow/high flow): normal
Est. flow rate (L/sec): —
Channel characteristics (straight/meandering, defined/poorly defined): Straight, poorly defined
Channel Gradient (H/M/L): L
Avg. Wetted Width (m): 0.2
Avg Water Depth (m): 0.01
Max Pool Depth (m): 0.09
Avg. Bankfull Width (m): 0.3
Avg. Bankfull Depth (m): 0.12
Substrate Composition (%) Boulder: / Cobble: Gravel: Fines: 90
Channel Morph (%) Flat: 100 Riffle: Run: Pool:
Bank Slope and Stability: /70 good

In-stream Habitat
In-stream Habitat Features (i.e woody debris): —
In-stream Vegetation: —

Riparian Habitat
Riparian Vegetation: [illegible]
Canopy Cover (% and species): Ø
Adjacent Land Use: [illegible]

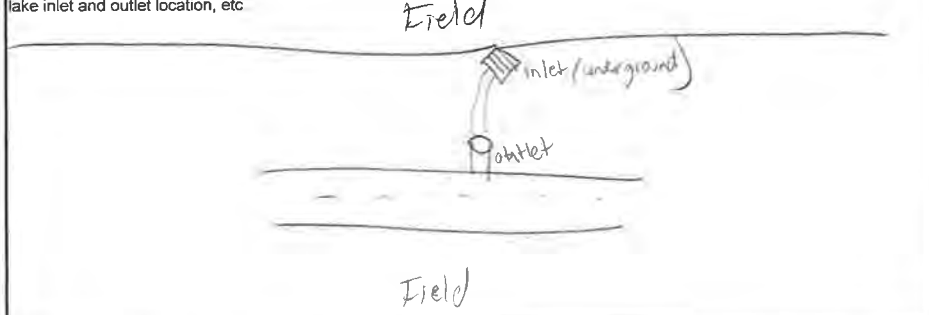
Surface Water
Temp (°C): Turbidity (L/M/H): L Colour: clear

Photographs	#	Direction Taken	Description	Other Photos
Upstream view	365	E		
Downstream view	366	W		
Channel	367			

General Comments/General Description of Watercourse
Fish observed, unusual conditions, topography, general land use and vegetation, channlized, naturalized, meandering, drainage characteristics etc

Waterbody (Y/N/Maybe) Discussion: N → tile outlet

Water Body Sketch
Include: watercourse name, flow direction, riffle/pool/run habitat, side tributaries,water body identifier, approx reach length, channel modifications, adjacent landuse, roads & road names, bridges, culverts, north arrow, origin of flow, drainage pattern, lake inlet and outlet location, etc



NATURAL RESOURCE SOLUTIONS INC.
Aquatic, Terrestrial and Wetland Biologists

Renewable Energy Water Body Site Investigation

Project (Number & Name): 1230 Adelaide
Field Staff: Brian W. Blair R.

Survey Date: 30-May-12
Time Started: 300
Time Finished: 310

Weather Conditions:
Temp (°C), Wind, Cloud Cover (%), Precipitation: 4° wind, poor, sprecip
Precipitation in Prior 48hrs (mm): 0

Site # WB44 Mustela Trib D
Drainage system: Moose River
Location in system: u/s Em Trce

GPS Location:
Easting: 0440 539
Northing: 4922810

Channel Dimensions and Morphology
Current stage (low flow/normal flow/high flow): —
Est. flow rate (L/sec): —
Channel characteristics (straight/meandering, defined/poorly defined): poorly defined (flood underground)
Channel Gradient (H/M/L): L
Avg. Wetted Width (m): —
Avg Water Depth (m): —
Max. Pool Depth (m): —
Avg. Bankfull Width (m): —
Avg. Bankfull Depth (m): —
Substrate Composition (%) Boulder: Cobble: Gravel: Fines: N/A
Channel Morph (%) Flat: 100 Riffle: Run: Pool:
Bank Slope and Stability: —

In-stream Habitat
In-stream Habitat Features (i.e woody debris): —
In-stream Vegetation: —

Riparian Habitat
Riparian Vegetation: grass
Canopy Cover (% and species): 0
Adjacent Land Use: Agriculture

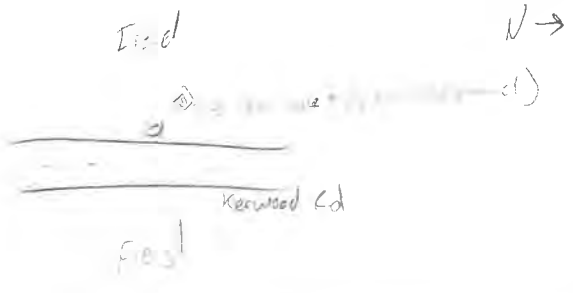
Surface Water
Temp (°C): —
Turbidity (L/M/H): —
Colour: —

Photographs	#	Direction Taken	Description	Other Photos
Upstream view	369	E		
Downstream view	367	W		
Channel	370		TC from inlet	

General Comments/General Description of Watercourse
Fish observed, unusual conditions, topography, general land use and vegetation, channlized, naturalized, meandering, drainage characteristics etc

Waterbody (Y/N/Maybe) Discussion: N - No surface water present - all underground

Water Body Sketch
Include: watercourse name, flow direction, riffle/pool/run habitat, side tributaries water body identifier, approx. reach length, channel modifications, adjacent landuse, roads & road names, bridges, culverts, north arrow, origin of flow, drainage pattern, lake inlet and outlet location, etc.



NATURAL RESOURCE SOLUTIONS INC.

Aquatic, Terrestrial and Wetland Biologists

Renewable Energy Water Body Site Investigation

Project # 1230	Project Name: Ashlu	Crew: BEB	Project Supervisor	Date Nov 2 - 11
Weather	Air temp	Wind	Precipitation	Cloud Cover	Survey start time:	Survey end time:

Indicate an X for yes and a strike through for no or not applicable

Site #	GPS	Bankfull width (m)	Max channel depth (m)	Wetted width (m)	Max water depth (cm)	Visual discharge estimate (L/s)	Water present (Y or N) + Refuge pool dimension	Water Clarity (L/M/H)	Substrate %'s (to equal 100%)	Channel Morphology (% pool, glide, slow riffle, fast riffle)	Channel Gradient (H/M/L)	In-channel vegetation (% and type) (i.e. terrestrial vs aquatic)	Groundwater indicators (seeps, springs, veg) NOTES	Photo # u/s	Photo # d/s	Photo # Channel
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
AHP3	L439390 U761806	5.2	X	X	X	X	Y				L	100% T. Grass	Grassed with veg	217	218	219
AHP2	439401 4762737	4.1	0.75	1.25	0.32	L	Y	H	10% Gravel 10% Cobble 80% fine	10% SR Riffle 30% GL. 60% Pool	L	100% T. Grass		221	222	223
[redacted]	[redacted]	X	X	X	X	X	[redacted]	X	X	X	X	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
AHP22	445169 4762784	4.0	1.0	1.6	0.12	L	Y	M	100% fine	30% SR Riffle 40% Glide 30% Pool	L	0	none	229	230	231
AHP23	445492 4762626	5.6	1.2	1.35	0.24	0	Y	M	100% fine	30% Riffle 70% Pool	L	100% T. Grass		232	233	234
AHP25	446112 4762779	X	X	X	X	X	N	X	X	X	X	100% T. Grass	grassed with veg	237	238	239

Site #	GPS 177	Bankfull width (m)	Max bankfull depth (m)	Wetted width (m)	Max water depth (cm)	Visual discharge estimate (L/s)	Water present (Y or N) + Refuge pool dimension	Water Clarity (L/M/H)	Substrate %'s (to equal 100%)	Channel Morphology (% pool, glide, slow riffle, fast riffle)	Channel Gradient (H/M/L)	In-channel vegetation (% and type) (i.e. terrestrial vs aquatic)	Groundwater indicators (seeps, springs, veg) NOTES	Photo # u/s	d/s	Channel
AHP 26	446417 4762562	X	X	X	X	X	N					100% T. Grass	Normal no surface water	N 241 E 242 S 243 W 244		
AHP 24	445755 4763046	4.5	3.1	2.6	1.5	L	Y	m	10% Bldr 20% cobble 70% fine	80% Pool 20% Glide	L	100% T Grass		245	246	247
AHP 14	441212 4759591	3.2	0.75	1.6	0.25	L	Y	m	80% fine 20% Bldr	10% SRiffle 90% Pool	L	100% T Grass	Boulder mostly Concrete Rubble	248	249	250
AHP 15	441668 4759542	4.0	1.0	0.2	0.09	L	Y	H	100% fine	80% Glide 20% SRiffle	L	100% T. Grass	Tile Drain inlet upstream	252 255 - Drain	253	254
AHP 16	441837 4759533	2.5	0.95	3	0.35	L	Y	L	90% fine 10% cobble	80% Pool 20% SRiffle	L	100% T. Grass	Multiple Tile Drain outlets	257 260 - Drains	258	259
AHP 17	442007 4759721	4.5	1.2	2.5	0.4	L	Y	m	80% fine 20% cobble	50% Glide 50% Pool	L	100% T. Grass	Under cut Banks	262	263	264
AHP 13	441560 4757476	3.25	0.4	3	0.12	0	Y	m	100% fine	100% fine	L	0	Detritus filled fully Shade	266	267	268
AHP 8	437712 4759779	1.5	0.3	X	X	X	N	X	100% fine	X	L	100% Terrestrial	Dry	270	271	272

NATURAL RESOURCE SOLUTIONS INC.

Aquatic, Terrestrial and Wetland Biologists

Renewable Energy Water Body Site Investigation

Project # 1230	Project Name: Ackley	Crew: Blake R.	Project Supervisor	Date
Weather Clear mild	Air temp 8-17	Wind 0-4	Precipitation 0	Cloud Cover 100%	Survey start time: 7:30	Survey end time:

Indicate an X for yes and a strike through for no or not applicable

Site #	GPS	Bankfull width (m)	Max channel depth (m)	Wetted width (m)	Max water depth (cm)	Visual discharge estimate (L/s)	Water present (Y or N) + Refuge pool dimension	Water Clarity (L/M/H)	Substrate %'s (to equal 100%)	Channel Morphology (% pool, glide, slow riffle, fast riffle)	Channel Gradient (H/M/L)	In-channel vegetation (% and type) (i.e. terrestrial vs aquatic)	Groundwater indicators (seeps, springs, veg) NOTES	Photo # u/s	Photo # d/s	Photo # Channel
34	440284 4764299	15.2	~5	13.1	~3.6	0	Y	L	70% fine 20% gravel 10% cobble	80% pool 20% glide	L	80% Terrestrial 20% riparian	none - very low turbidity	144	145	146
33	441114 4764308	2.1	0.7	1.0	0.2	L	Y	M	40% cobble 60% fine	30% SR riffle 70% glide	L	100% Terrestrial grass	none	147	148	149
32	441794 4764301						N						No channel or water - Tile Drain	N 150 E 151 S 152 W 153		
31	442318 4764290	2.0	0.2	1.7	0.2	0	Y	H	10% cobble 90% fine	100% pool	L	100% terrestrial	- Algae pres.	155	156	157
30	443276 4764274	3.4	0.9	3.0	0.27	0	Y	M	20% gravel 80% fine	10% SR riffle 30% Glide 60% pool	L	100% Terrestrial	none	158	159	160
29	444020 4764282												grass terrestrial Normal	N 161 E 162 S 163 W 164		
28	444365 4764273												not even grass within Levee	N 165 E 166 S 167 W 168		

Site #	GPS 17T	Bankfull width (m)	Max bankfull depth (m)	Wetted width (m)	Max water depth (cm)	Visual discharge estimate (L/s)	Water present (Y or N) + Refuge pool dimension	Water Clarity (L/M/H)	Substrate %'s (to equal 100%)	Channel Morphology (% pool, glide, slow riffle, fast riffle)	Channel Gradient (H/M/L)	In-channel vegetation (% and type) (i.e. terrestrial vs aquatic)	Groundwater indicators (seeps, springs, veg) NOTES	Photo # u/s	Photo # d/s	Photo # Channel
27	444751 4764275	—	—	—	—	—	N	—	100% Fine	—	L	~100% Terrestrial	None; no defined channel or water	N 170 E 171 S 172 W 173		
21	444911 476[illegible]585	2.7	1.1	1.3	0.21	L	Y	m	60% fine 40% cobble	5% S Riffle 95% glide	L	100% T.Grass	None	175	176	177
20	444904 4760[illegible]18	—	—	—	—	—	N	—	—	—	—	—	no water or Defined channel	N 188 E 189 S 190 W 191		
9	438299 4759228	—	—	—	—	—	N	—	—	—	—	100% Terrestrial	no surface water or channel; Buried tile Drain inlet	N 192 E 193 S 194 W 195 Drain 196		
18	444877 4760144	1.6	0.6	0.6	0.15	L	Y	H	30% cobble 30% gravel 40% fine	70% glide 30% fine	L	30% aquatic 70% T.Grass	algae present	179	180	181
19	444892 4760387	—	—	—	—	—	N	—	—	—	—	—	no water or Defined channel	N 183 E 184 S 185 W 186		
6	439693 4760183	7.0	0.4	6.1	0.2	0	Y	L	80% cobble 10% gravel 10% fine	99% pool 1% glide	L	80% T.Grass 20% aquatic	none; Tile outlet	198	199	200
7	440313 4760181	1.75	0.2	X	X	X	N	X	90% cobble 10% fine	X	L	60% cattail 40% T.Grass	Dry; Tile outlet	201	202	203
5	439384 4760732	3.2	X	X	X	X	N	X	X	X	L	100% T.Grass	Grassed waterway	205	206	207
4	439394 4761450	3.6	1.1	2.1	0.4	0	Y	m	40% cobble 30% gravel 30% fine	60% pool 30% glide 10% S Riffle	L	100% T.Grass	none	209	210	211

Appendix II
Site Investigation Photographs

1230 Adelaide Wind Energy Centre Water Body Photographs

Adelaide Creek Subwatershed

Adelaide Creek

Figure 1 WB59 (upstream)

Figure 2 WB60 (upstream)

Figure 3 WB34 (downstream)

Adelaide Creek Tributary A

Figure 3 WB48 (upstream)

Figure 5 WB61 (grassed waterway)

Adelaide Creek Tributary B

Figure 6 WB1 (grassed waterway)

Adelaide Creek Tributary C

Figure 7 WB31 (downstream)

Adelaide Creek Tributary D

Figure 8 WB32 (no surface water body)

Adelaide Creek Tributary E

Figure 9 WB33 (upstream)

Adelaide Creek Tributary F

Figure 10 WB64 (upstream)

Cleland Drain

Figure 11 WB2 (upstream)

Brent Drain A

Figure 12 WB3 (grassed waterway)

Wilson Drain

Figure 13 WB4 (upstream)

Brown Drain

Figure 14 WB7 (upstream)

Brown Drain Branch A

Figure 15 WB6 (upstream)

Brown Drain Branch B

Figure 16 WB5 (grassed waterway)

Morgan Drain

Figure 17 WB15 (upstream)

Figure 18 WB16 (downstream)

Figure 19 WB17 (upstream)

Morgan Drain Branch A

Figure 20 WB14 (upstream)

Down Drain

Figure 21 WB18 (upstream)

Branton Drain

Figure 22 WB19 (grassed waterway)

Figure 23 WB20 (no surface water body)

Rombout Drain

Figure 24 WB29 (no surface water body)

Seeds Drain

Figure 25 WB30 (upstream)

Figure 26 WB38 (upstream)

Figure 27 WB56 (no surface water body)

Figure 28 WB55 (no surface water body)

Mud Creek Subwatershed

Dodman's Drain

Figure 29 WB22 (upstream)

Figure 30 WB21 (upstream)

Figure 31 WB39 (downstream)

Figure 32 WB51 (downstream)

Walker Drain

Figure 33 WB23 (upstream)

Sutherland Drain

Figure 34 WB24 (upstream)

Vangeffen Drain

Figure 35 WB25 (no surface waterbody)

Figure 36 WB26 (no surface waterbody)

Ausable River Watershed

Ausable River

Figure 37 WB41 (upstream)

Ausable Tributary A

Figure 38 WB44 (no surface water body)

Ausable Tributary D

Figure 39 WB40 (no surface water body)

Lenting Drain Drainage Catchment

Lenting Drain

Figure 40 WB42 (upstream)

Figure 41 WB10 (upstream)

Figure 42 WB11 (upstream)

Big Swamp Drain Drainage Catchment

Big Swamp Drain

Figure 43 WB68 (Downstream)

Ptsebe Creek Drainage Catchment

Ptsebe Tributary A

Figure 44 WB65 (upstream)

Ptsebe Tributary B

Figure 45 WB62 (grassed waterway)

Figure 46 WB63 (grassed waterway)