E-23B

Straits of Mackinac Structural Integrity Support Span Repair Log

Enbridge Project #	Enbridge Project Manager	Enbridge on-site Rep
WJPJ-19972-10	TOM Drew	Same
Contractor	**Contractor Project Number**	**Contract supervisor**
Veolia ES Spec. Serv.	490259S.10.071	Chris Bauer

Pipeline Operation Information

Is leg shutdown?	No
If so, date shutdown	NA
Time Shutdown	NA
Product In Line	crude
If flowing, flow rate	—

Density —

Time System for Time Shutdown —

Survey Geodetic Parameters

Grid	SP (NAD 83)
Zone	MI Central 2112
Survey Units	U.S. Feet
Ellipsoid	WGS-84
GPS Correction	RTK
Qty of Satellites	9
RTK Fix	Diff

Span Information

Date Surveyed	9-26-12
Tape Number	SD 6
Direction Flown	S - N
Water Depth	80
Current Year Span #	E-23B
Previous Span #(s)	E-23B
Addit. Extensions Used?	Yes
Length of Extension(s)	7'
Drilling Issues?	No

Anchor Positions —

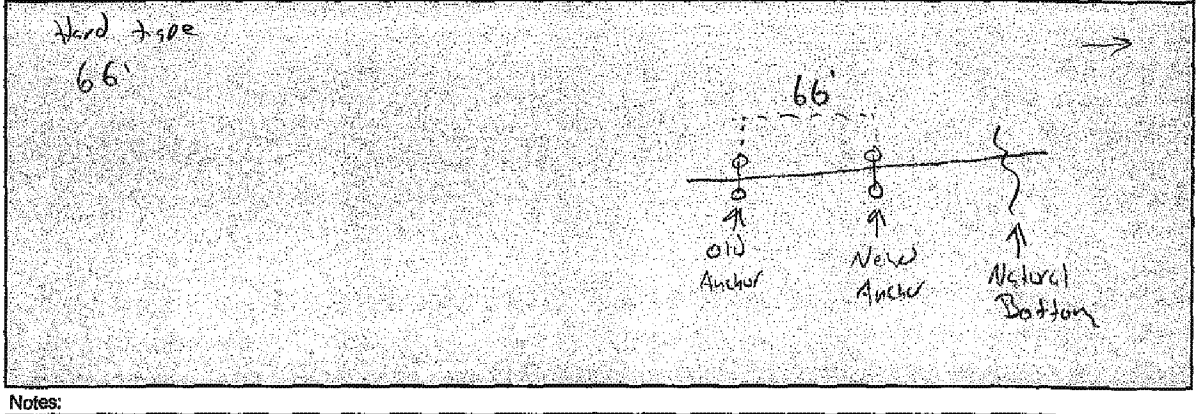
Digital File Name or DVD # —

Current Year Span Length	93
Previous Year Span Length	87
Number of Dives to Complete	1
Date(s) of Dive(s)	9-26-12
Dive number(s) for current campaign	30

* Drilling issues: include torque spec not met, modified screws, modified assembly, etc...

	South End	North End	Repair
Tape Counter	0000	3:50	1:36
LinkQuest Northing	906044.39	906140.87	906119.40
LinkQuest Easting	19582939.79	19582964.83	19582955.88
Digital File Filename	—	—	—
Digital File Time	18:08	18:08	18:04
Display Time	18:02	18:06	18:04
Bottom Type at Repair	Sand/Clay	Sand/Clay	Sand/Clay
Highest Span Height	2'	1'	0.5'
TD O'clock Positions			

Span Repair Sketch: Include North and South natural TD's, previously installed repairs, repair numbers, debris/trash, natural outcrops, and hardline diver's measurements.



Notes:

W-72B

Straits of Mackinac Structural Integrity Support Span Repair Log

Enbridge Project #	Enbridge Project Manager	Enbridge on-site Rep
WJPJ-19972-10	Tom Prew	Same
Contractor	**Contractor Project Number**	**Contract supervisor**
Veolia ES Spec. Serv.	490259S.10.071	Chris Brew

Survey Geodetic Parameters	
Grid	SP (NAD 83)
Zone	MI Central 2112
Survey Units	U.S. Feet
Ellipsoid	WGS-84
GPS Correction	RTK
Qty of Satellites	9
RTK Fix	Diff

Pipeline Operation Information

Is leg shutdown?	NO		
If so, date shutdown	NA		
Time Shutdown	NA		
Product in Line	Crude	Density	–
If flowing, flow rate	–	Time System for Time Shutdown	–

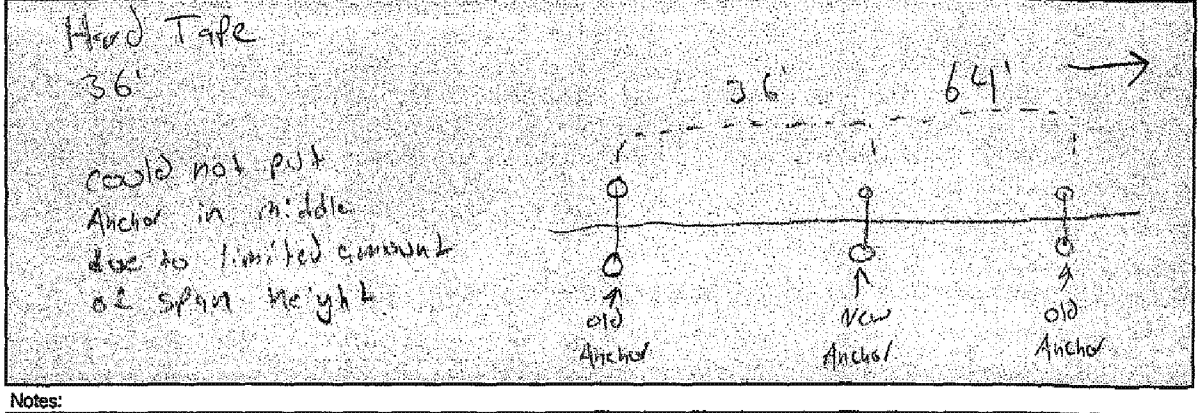
Span Information

Date Surveyed	9-27-12	Anchor Positions	–
Tape Number	SD6		–
Direction Flown	S-N	Digital File Name or DVD #	✓
Water Depth	250		
Current Year Span #	W-72B	Current Year Span Length	100
Previous Span #(s)	W-72B	Previous Year Span Length	100
Addit. Extensions Used?	Y	Number of Dives to Complete	2
Length of Extension(s)	7'.	Date(s) of Dive(s)	9-27-12
Drilling Issues?	NO	Dive number(s) for current campaign	31, 32

* Drilling Issues: include torque spec not met, modified screws, modified assembly, etc...

	South End	North End	Repair
Tape Counter	00:00	03:26	01:20
LinkQuest Northing	912337.16	912441.22	912375.43
LinkQuest Easting	19583341.21	19583367.00	19583353.24
Digital File Filename	–	–	–
Digital File Time	13:03	13:07	13:05
Display Time	13:03	13:07	13:05
Bottom Type at Repair	Sand/clay	Sand clay	Sand clay
Highest Span Height	3'	2'	1'
TD O'clock Positions			

Span Repair Sketch: Include North and South natural TD's, previously installed repairs, repair numbers, debris/trash, natural outcrops, and hardline diver's measurements.



Notes:

F-32A

Straits of Mackinac Structural Integrity Support Span Repair Log

Enbridge Project #	Enbridge Project Manager	Enbridge on-site Rep
WJPJ-19972-10	Tom Pfeil	Same
Contractor	**Contractor Project Number**	**Contract supervisor**
Veolia ES Spec. Serv.	490259S.10.071	Chris Beyer

Pipeline Operation Information

Is leg shutdown?	No		
If so, date shutdown	N/A		
Time Shutdown	N/A		
Product in Line	Crude	Density	–
If flowing, flow rate		Time System for Time Shutdown	–

Survey Geodetic Parameters

Grid	SP (NAD 83)
Zone	MI Central 2112
Survey Units	U.S. Feet
Ellipsoid	WGS-84
GPS Correction	RTK
Qty of Satellites	9
RTK Fix	Y/N

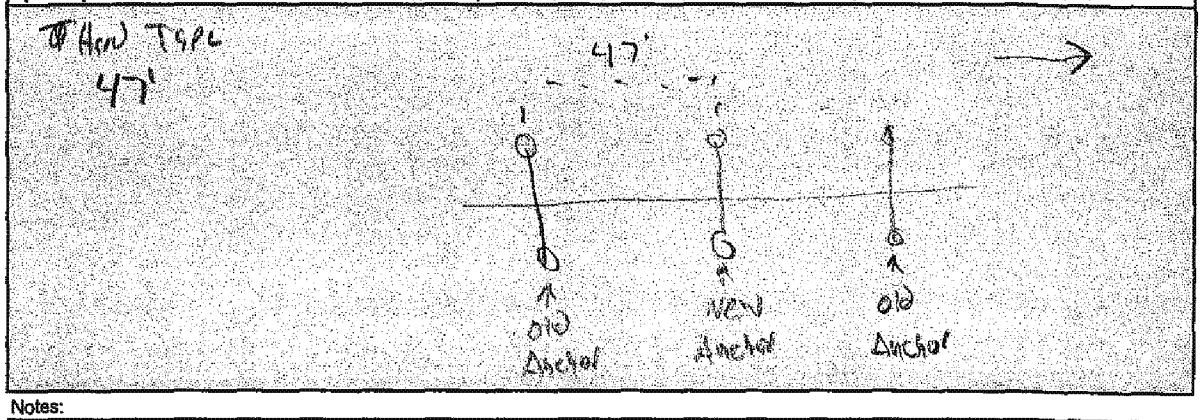
Span Information

Date Surveyed	9-27-12	Anchor Positions	–
Tape Number	S07		–
Direction Flown	S-N	Digital File Name or DVD #	✓
Water Depth	90		
Current Year Span #	E-32A	Current Year Span Length	92
Previous Span #(s)	E-32A	Previous Year Span Length	92
Addit. Extensions Used?	Yes	Number of Dives to Complete	1
Length of Extension(s)	7'	Date(s) of Dive(s)	9-27-12
Drilling Issues?	No	Dive number(s) for current campaign	34

* Drilling Issues: include torque spec not met, modified screws, modified assembly, etc...

	South End	North End	Repair
Tape Counter	0:00	3:02	31.25
LinkQuest Northing	907433.29	907592.52	907479.22
LinkQuest Easting	1958306.39	1958329.91	1958314.60
Digital File Filename	–	–	–
Digital File Time	19:14	19:17	19:15
Display Time	19:14	19:17	19:15
Bottom Type at Repair	Sand	Sand	Sand
Highest Span Height	2'	2'	2'
TD O'clock Positions			

Span Repair Sketch: Include North and South natural TD's, previously installed repairs, repair numbers, debris/trash, natural outcrops, and hardline diver's measurements.



Notes:

E-61C

Straits of Mackinac Structural Integrity Support Span Repair Log

Enbridge Project #	Enbridge Project Manager	Enbridge on-site Rep
WJPJ-19972-10	Tom Prew	Same
Contractor	**Contractor Project Number**	**Contract supervisor**
Veolia ES Spec. Serv.	490259S.10.071	Chris Beuer

Pipeline Operation Information	
Is leg shutdown?	N/O
If so, date shutdown	NA
Time Shutdown	NA
Product in Line	Crude
If flowing, flow rate	—

Density —

Time System for Time Shutdown —

Survey Geodetic Parameters	
Grid	SP (NAD 83)
Zone	MI Central 2112
Survey Units	U.S. Feet
Ellipsoid	WGS-84
GPS Correction	RTK
Qty of Satellites	10
RTK Fix	Diff

Span Information

Date Surveyed	9-28-12
Tape Number	SD7
Direction Flown	S-N
Water Depth	145
Current Year Span #	E-61C
Previous Span #(s)	E-61C
Addit. Extensions Used?	1
Length of Extension(s)	7'
Drilling Issues?	NO

Anchor Positions —

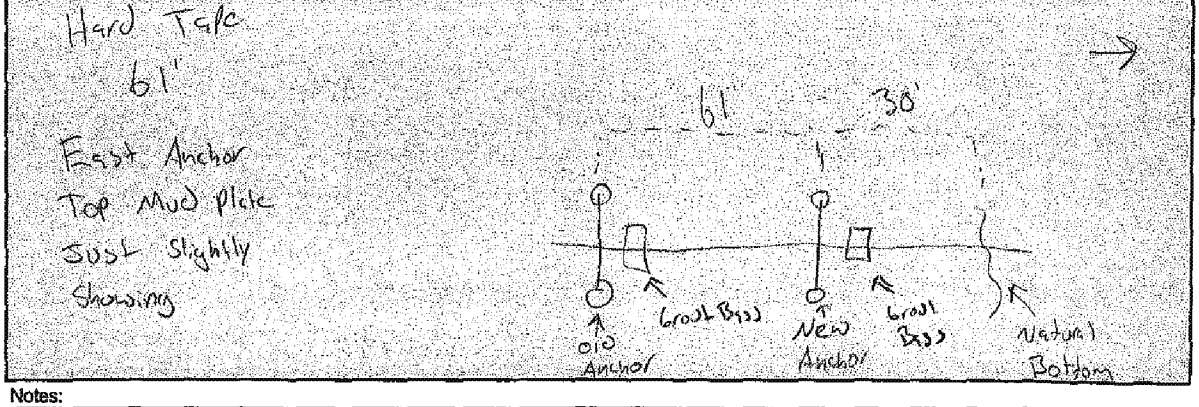
Digital File Name or DVD # —

Current Year Span Length	91'
Previous Year Span Length	65'
Number of Dives to Complete	1
Date(s) of Dive(s)	9-28-12
Dive number(s) for current campaign	35

* Drilling Issues: include torque spec not met, modified screws, modified assembly, etc...

	South End	North End	Repair
Tape Counter	0:00	4:10	1:35
LinkQuest Northing	911270.10	911356.62	911325.93
LinkQuest Easting	1958435.28	1958437.88	1958436.91
Digital File Filename	—	—	—
Digital File Time	10:33	10:38	10:35
Display Time	10:33	10:38	10:35
Bottom Type at Repair	clay	Clay	clay
Highest Span Height	2'	0'	2'
TD O'clock Positions			

Span Repair Sketch: Include North and South natural TD's, previously installed repairs, repair numbers, debris/trash, natural outcrops, and hardline diver's measurements.



Notes:

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E-52

Straits of Mackinac Structural Integrity Support Span Repair Log

Enbridge Project #	Enbridge Project Manager	Enbridge on-site Rep
WJPJ-19972-10	Tom Prew	Same
Contractor	**Contractor Project Number**	**Contract supervisor**
Veolia ES Spec. Serv.	490259S.10.071	Chris Bauer

Pipeline Operation Information

Is leg shutdown?	NO		
If so, date shutdown	NA		
Time Shutdown	NA		
Product In Line	crude	Density	—
If flowing, flow rate	—	Time System for Time Shutdown	—

Survey Geodetic Parameters	
Grid	SP (NAD 83)
Zone	MI Central 2112
Survey Units	U.S. Feet
Ellipsoid	WGS-84
GPS Correction	RTK
Qty of Satellites	8
RTK Fix	DGPS

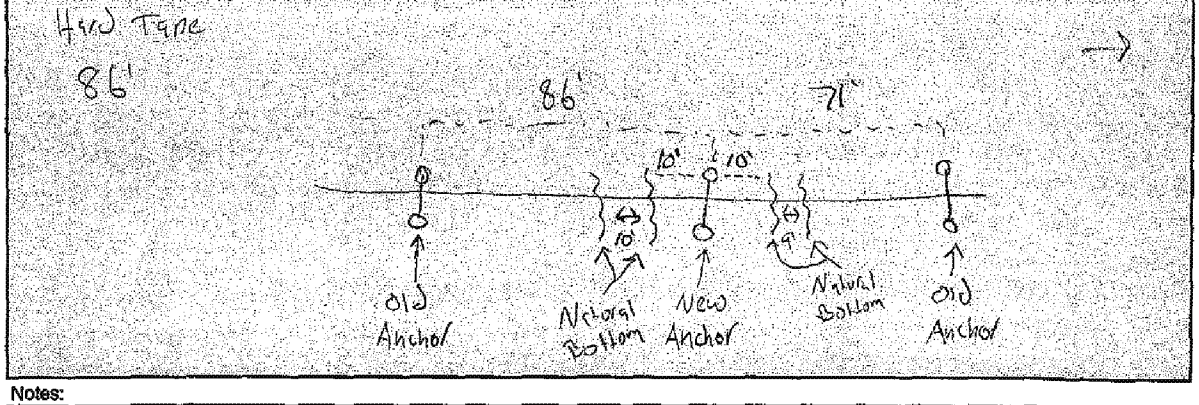
Span Information

Date Surveyed	9-28-12	Anchor Positions	—
Tape Number	SD8		—
Direction Flown	S-N	Digital File Name or DVD #	—
Water Depth	125		
Current Year Span #	E-52	Current Year Span Length	16
Previous Span #(s)	E-52	Previous Year Span Length	14
Addit. Extensions Used?	Yes	Number of Dives to Complete	1
Length of Extension(s)	1-3' ; 1-7'	Date(s) of Dive(s)	9-28-12
Drilling Issues?		Dive number(s) for current campaign	36

* Drilling Issues: include torque spec not met, modified screws, modified assembly, etc...

	South End	North End	Repair
Tape Counter	13:03	16:02	14:45
LinkQuest Northing	910476.39	910497.54	910486.74
LinkQuest Easting	1958413G.29	1958414I.11	1958413B.82
Digital File Filename	—	—	—
Digital File Time	13:54	13:57	1355
Display Time	13:54	13:57	13:55
Bottom Type at Repair	Clay	Clay	Clay
Highest Span Height	01	01	1'
TD O'clock Positions			

Span Repair Sketch: Include North and South natural TD's, previously installed repairs, repair numbers, debris/trash, natural outcrops, and hardline diver's measurements.



Notes:

W-60 B

Straits of Mackinac Structural Integrity Support Span Repair Log

Enbridge Project #	Enbridge Project Manager	Enbridge on-site Rep
WJPJ-19972-10	Tom Prew	Some
Contractor	**Contractor Project Number**	**Contract supervisor**
Veolia ES Spec. Serv.	490259S.10.071	Chris Bauer

Survey Geodetic Parameters	
Grid	SP (NAD 83)
Zone	MI Central 2112
Survey Units	U.S. Feet
Ellipsoid	WGS-84
GPS Correction	RTK
Qty of Satellites	9
RTK Fix	D.GF

Pipeline Operation Information			
Is leg shutdown?	No		
If so, date shutdown	NA		
Time Shutdown	NA		
Product In Line	Crude	Density	—
If flowing, flow rate	—	Time System for Time Shutdown	—

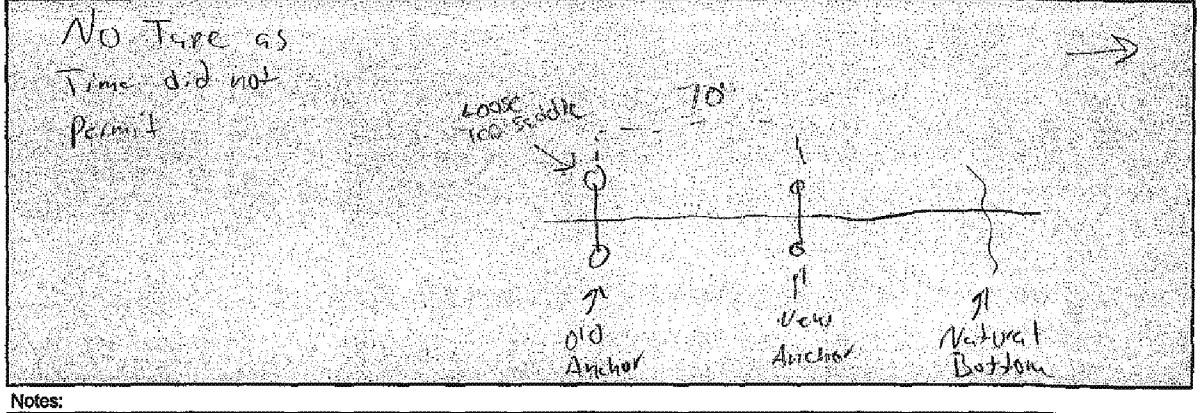
Span Information

Date Surveyed	8-28-12	Anchor Positions	—
Tape Number	SD 8		—
Direction Flown	S-N	Digital File Name or DVD #	—
Water Depth	155		
Current Year Span #	W-60B	Current Year Span Length	90
Previous Span #(s)	W-60B	Previous Year Span Length	91
Addit. Extensions Used?	Yes	Number of Dives to Complete	1
Length of Extension(s)	1-3' & 1-7'	Date(s) of Dive(s)	9-28-12
Drilling Issues?	NO	Dive number(s) for current campaign	37

* Drilling Issues: include torque spec not met, modified screws, modified assembly, etc...

	South End	North End	Repair
Tape Counter	0:30	5:30	2:15
LinkQuest Northing	913963.81	914068.01	914031.30
LinkQuest Easting	1958384.60	1958312.72	1958302.98
Digital File Filename	—	—	—
Digital File Time	19:11	19:15	19:13
Display Time	19:11	19:15	19:13
Bottom Type at Repair	Clay	Clay	Clay
Highest Span Height	1'	0'	1'
TD O'clock Positions			

Span Repair Sketch: Include North and South natural TD's, previously installed repairs, repair numbers, debris/trash, natural outcrops, and hardline diver's measurements.



Notes:

ENBDNR0000403

W-41A

Straits of Mackinac Structural Integrity Support Span Repair Log

Enbridge Project #	Enbridge Project Manager	Enbridge on-site Rep
WJPJ-19972-10	Tom Mau	Steve
Contractor	**Contractor Project Number**	**Contract supervisor**
Veolia ES Spec. Serv.	490259S.10.071	Chris Teuw

Survey Geodetic Parameters	
Grid	SP (NAD 83)
Zone	MI Central 2112
Survey Units	U.S. Feet
Ellipsoid	WGS-84
GPS Correction	RTK
Qty of Satellites	
RTK Fix	

Pipeline Operation Information

Is leg shutdown?	9-29-12		
If so, date shutdown	NO		
Time Shutdown	NA		
Product In Line	crude	Density	
If flowing, flow rate	—	Time System for Time Shutdown	

Span Information

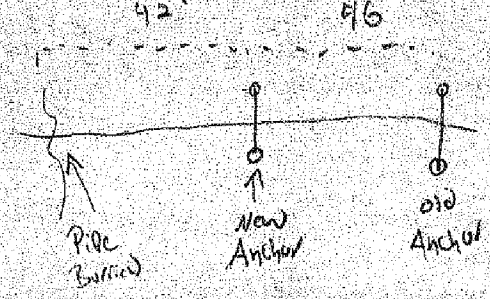
Date Surveyed	9-29-12	Anchor Positions	—
Tape Number	SD9		—
Direction Flown	S-N	Digital File Name or DVD #	—
Water Depth	145		
Current Year Span #	W-41 A	Current Year Span Length	42
Previous Span #(s)	W-41 A	Previous Year Span Length	89
Addit. Extensions Used?	Yes	Number of Dives to Complete	1
Length of Extension(s)	1-3' & 1-7'	Date(s) of Dive(s)	9-29-12
Drilling Issues?	NO	Dive number(s) for current campaign	39

* Drilling Issues: include torque spec not met, modified screws, modified assembly, etc...

	South End	North End	Repair
Tape Counter	0:00	2:07	1:20
LinkQuest Northing	910147.35	910235.36	910189.03
LinkQuest Easting	1958266.52	1958287.87	1958273.30
Digital File Filename	—	—	—
Digital File Time	11:11	11:18	11:13
Display Time	11:11	11:18	11:13
Bottom Type at Repair	Clay	Clay	Clay
Highest Span Height	0'	2'	2'
TD O'clock Positions			

Span Repair Sketch: Include North and South natural TD's, previously installed repairs, repair numbers, debris/trash, natural outcrops, and hardline diver's measurements.

Not enough time for Hard Type



Notes:

ENBDNR0000404