



PIPELINE SCHEMATIC	HORIZONTAL STATIONS (2D)	STATION DESCRIPTION	SLOPE STATIONS (3D)	PIPELINE DATA REPRESENTATION (3D)
HEAVY WALL PIPE	910+00	MATCHLINE	910+00	MATCHLINE
WELD FITTING	923+48	CL DITCH	923+48	CL DITCH
TRANSITION PIECE	924+86	WATER EDGE	924+86	WATER EDGE
CASING PIPE	924+86	CL JAMES RIVER	924+86	CL JAMES RIVER
CONCRETE COATING	927+66	WATER EDGE	927+66	WATER EDGE
SET ON WELLS	928+48	HDD ENTRY	928+48	HDD ENTRY
PIPELINE WARNING SIGN	928+48	HDD ENTRY	928+48	HDD ENTRY
PIPELINE MARKER	928+48	HDD ENTRY	928+48	HDD ENTRY
MATERIAL ITEM	928+48	HDD ENTRY	928+48	HDD ENTRY
GROUNDING MAT	938+07	P.L. 01'07'02" RT.	938+07	P.L. 01'07'02" RT.
ZINC RIBBON	941+87	P.L. 01'07'07" LT.	941+87	P.L. 01'07'07" LT.
AERIAL MARKER	941+87	FENCE (BARBED WIRE)	941+87	FENCE (BARBED WIRE)
CATHODIC TEST STATION	942+24	M.P. 425	942+24	M.P. 425
MAINLINE VALVE	942+24	M.P. 425	942+24	M.P. 425
CHECK VALVE	942+24	M.P. 425	942+24	M.P. 425
OPEN CUT	944+88	5.1 CVR.	944+88	5.1 CVR.
BORE	944+88	5.1 CVR.	944+88	5.1 CVR.
DRINKING WATER USA	952+27	P.L. 03'19'37" RT.	952+27	P.L. 03'19'37" RT.
ECOLOGICAL USA	952+27	P.L. 03'19'37" RT.	952+27	P.L. 03'19'37" RT.
HIGHLY POPULATED AREA	952+27	P.L. 03'19'37" RT.	952+27	P.L. 03'19'37" RT.
OPERATOR (KEYSTONE) DEFINED	952+27	P.L. 03'19'37" RT.	952+27	P.L. 03'19'37" RT.
OTHER POPULATED AREA	952+27	P.L. 03'19'37" RT.	952+27	P.L. 03'19'37" RT.
SOURCE WATER PROTECTION AREA	952+27	P.L. 03'19'37" RT.	952+27	P.L. 03'19'37" RT.
WELLHEAD PROTECTION AREA	952+27	P.L. 03'19'37" RT.	952+27	P.L. 03'19'37" RT.
TEST SECTIONS (3D)	937+89	TEST SECTION 4B-1A ILTO-028-2010	937+89	TEST SECTION 4B-2 ILTO-028-2010

GENERAL NOTES

- ALL CHAINAGES ARE IN FEET UNLESS OTHERWISE SPECIFIED.
- DATUM ELEVATION AND PROJECTION ARE BASED ON MEAN SEA LEVEL AND NAD 83.
- FIELD PIPE LOCATING REQUIRED TO DETERMINE PLACEMENT OF PIPELINE WITHIN PERMANENT EASEMENT.
- UNLESS OTHERWISE NOTED, 48 INCHES MINIMUM COVER EXCEPT 36 INCHES IN AREAS OF CONSOLIDATED ROCK.
- NO ACTUAL AS-BUILT GROUND SHOTS WERE TAKEN AT THIS LOCATION. THE PROFILE REPRESENTS A PROJECTION FROM SHOTS TAKEN AT 150' TO 250' INTERVALS.
- TWO TYPES OF COATING WERE APPLIED TO THE FIELD WELDS DURING THE ORIGINAL CONSTRUCTION. ONE TYPE WAS TWO COMPONENT LIQUID EPOXY. THE PRODUCTS USED WERE DENSO 7200 OR SPC SP-2888. THE OTHER TYPE THAT WAS APPLIED TO THE FIELD WELDS WAS FBE. THE PRODUCT NAME WAS 3M 6223 11G.
- THE SUBSTANTIAL CONSTRUCTION COMPLETION DATE, BASED ON CALIPER PIG RUN, WAS AUGUST 17, 2009 FOR M.P. 403.90 TO 422.96 AND OCTOBER 28, 2009 FOR M.P. 422.96 TO 463.18.
- ORIGINAL IN-SERVICE DATE OF THE KEYSTONE PIPELINE (PHASE 1): JUNE 30, 2010.
- CPS CALCULATION DATE: MAY 2010.
- ORION STATION SERIES NUMBER: 1182700.
- TO DETERMINE THE MILE POST AT A GIVEN LOCATION, ADD THE 3D STATION NUMBER FROM THIS SEGMENT TO STATION NUMBER 21486-76 AND DIVIDE BY 5280.

OPERATING AND TEST PRESSURE

- THE MAXIMUM OPERATING PRESSURE (MOP) IS 1440 PSIG.
- THE MINIMUM TEST PRESSURE WAS 900 PSIG.

BILL OF MATERIALS (3D)

ITEM NO.	DESCRIPTION	QUANTITY
2	30" O.D. X 0.386" W.T., API-5L X-70 W/FBE COATING	9,388'
3	30" O.D. X 0.516" W.T., API-5L X-70 W/FBE COATING & ABRASION RESISTANT OVERCOAT	318'
4	30" O.D. X 0.822" W.T., API-5L X-70 W/FBE COATING & ABRASION RESISTANT OVERCOAT	2,536'
6	30" O.D. X 0.429" W.T., API-5L X-70 W/FBE COATING	780'

REFERENCE DRAWINGS

REF. NO.	DRAWING NO.	REV. NO.	DRAWING TITLE
HDD	1836-03-ML-03-003	2	JAMES RIVER AT FREEMAN HDD INSTALLATION

REVISIONS

NO.	DATE	REV. BY	CHKD. BY	APPD. BY	DESCRIPTION
1	5/17/09	UEI	RDG	LAG	ISSUED FOR CONSTRUCTION
2	10/17/09	UEI	RDG	LAG	ISSUED FOR AS-BUILT
					1836-03-ML-02-008 REPLACES COVERAGE OF IFC DRAWINGS
					1836-03-ML-02-012
					1836-03-ML-02-013

ENGINEERING RECORDS

DRAWN BY	INITIAL	DATE	ENY. APPRD.	INITIAL	DATE
UEI		10/03/01			

PROFESSIONAL ENGINEER

NAME	STATE	LIC#	REV#	DATE
LOYS ALVIN GRAY, III	SD	CE9004		

SCALE: 0 125 250 500 Feet

TransCanada
In business to deliver

KEYSTONE MAINLINE (NPS 30 2009) FREEMAN SECTION

1836 1836 SPREAD 4B DISCIPLINE 03

AS-BUILT ALIGNMENT

M.P. 424.39 TO M.P. 426.85
SHEET 8 OF 13 SHEETS
STA. 910+93 TO STA. 1041+15 (3D)

DRAWING NO. 1836-03-ML-02-008 REV. 2