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Longhorn Pipeline Crude Reversal Project  
Longhorn Mitigation Plan  
Self-Audit Report  
For  
Magellan Midstream Partners, L.P.  
  
Phase II Report  
September 23, 2013



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## 1.0 Definitions

CMS: Compliance Management System

Longhorn: the entire pipeline system and all parties including LPP and MPL

LPP: Longhorn Partners Pipeline (the asset owner until August 27, 2009 and its direct employees / contractors, excluding MPL)

LPSIP: Longhorn Pipeline System Integrity Plan

MPL: Magellan Pipeline Company, L.P. (the asset operator and owner as of August 27, 2009)

SIP: Magellan Midstream Partners, L.P. System Integrity Plan

Operator: Magellan Pipeline Company, L.P. (MPL)

EA: Environmental Assessment

MiC: Mitigation Commitment

MC: Management Commitment

PE: Process Element

SBRMA: Scenario Based Risk Mitigation Analysis

SIP: System Integrity Plan



## 2.0 Introduction

The Longhorn Pipeline System (Longhorn) was initiated in the mid-1990s, with the intent of converting an existing West Texas crude oil pipeline into refined products service, and reversing the flow to take refined products from the Houston Gulf Coast area to markets in West Texas and the Southwest US. The project encountered opposition from various groups, resulting in a lawsuit and eventual settlement.

Longhorn agreed to implement a Longhorn Mitigation Plan (LMP) as part of the Environmental Assessment (EA). The LMP includes 40 “Mitigation Commitments” that addressed various integrity issues on the Longhorn system both before and after start-up. The LMP also committed Longhorn to implement the Longhorn Pipeline System Integrity Plan (LPSIP), which includes three main elements:

1. Management Commitments (14 total), addressing various integrity management programs for the pipeline system, including a commitment to conduct a self-audit of the LPSIP each year,
2. LPSIP Process Elements (12 total), addressing various risk management processes for the pipeline system, and
3. An Operational Reliability Assessment (ORA), providing an independent technical analysis of various integrity threats on the pipeline system.



### **3.0 Longhorn Reversal Project**

In 2011, Magellan started development of a project to reverse the Longhorn Pipeline from Crane to Houston, Texas to transport crude oil (Reversal Project). This project was done in two Phases. Phase I, completed in 2013, encompassed changes to existing pump stations, removal of check valves, and other work required to enable the pipeline to flow 135,000 BPD of crude oil from Crane to Houston. Phase II's scope is to install six new stations and make modifications at six existing stations to allow a flow rate of 225,000 BPD.

To ensure compliance with the LMP, Magellan contracted with RCP Inc., a regulatory and engineering consulting firm, to perform an audit of this project. The project is broken into various sub-projects, some of which do not affect the original Longhorn system. The scope of RCP's work is limited to the portion of the project included in the original Longhorn Mitigation Plan.

RCP's role in this audit is not to advise Magellan on how to do the project but to help ensure compliance with the LMP and SIP while doing the project. RCP agreed to provide quarterly reports to Magellan for Phase I. A final report on Phase I of the Reversal Project was completed March 5, 2013. This report covers Phase II consisting of general items required for all pump stations and matrix covering specific start up items for each station. The start up of stations will be staggered and therefore supplemental reports will be submitted prior to start up of each one.

## 4.0 Findings for the LMP Mitigation Commitments

The first Mitigation Commitment describes, in general, Magellan's commitment to operate the Longhorn pipeline in a safe manner and to follow the additional 39 Mitigation Commitments described in the LMP which are addressed below.

### 4.1 **MiC1: Hydrostatically test the Tier III and Tier II areas of the pipeline**

Applicable to the Reversal Project? NO

### 4.2 **MiC2: "Proof" test the pipeline between J-1 Valve and Crane Station**

Applicable to the Reversal Project? NO

### 4.3 **MiC3: Replace approximately 19 miles of pipeline**

Applicable to the Reversal Project? NO

### 4.4 **MiC4: Perform additional cathodic protection mitigation work**

Applicable to the Reversal Project? NO

### 4.5 **MiC5: Lower, replace or recondition pipe at 12 locations**

Applicable to the Reversal Project? NO

### 4.6 **MiC6: Remove stopple fittings at three locations**

Applicable to the Reversal Project? NO

### 4.7 **MiC7: Excavate at pipeline at two locations**

Applicable to the Reversal Project? NO

### 4.8 **MiC8: Replace pipeline at Rabb Creek crossing and investigate 5 dent locations**

Applicable to the Reversal Project? NO





**4.9 MiC9: Remediate any maximum allowable surge pressure problems identified by Longhorn’s most recent surge analysis**

Applicable to the Reversal Project? YES

Changes to the Mitigation Commitment required by the Reversal Project? NO

Actions required to comply with the Mitigation Commitment:

Required Action	Status
Update surge analysis to reflect flow reversal and address any issues identified	Phase II surge analysis submitted to PHMSA on June 13, 2013. PHMSA approval was received July 24, 2013.

**4.10 MiC10: Inspect pipeline with transverse field magnetic flux inspection tool**

Applicable to the Reversal Project? NO

**4.11 MiC11: Inspect pipeline with high resolution magnetic flux leakage tool**

Applicable to the Reversal Project? NO

**4.12 MiC12/12A: Inspect pipeline with ultrasonic wall measurement tool and “smart” geometry inspection tool**

Applicable to the Reversal Project? NO

**4.13 MiC13/Mitigation Appendix Item 13: Install enhanced leak detection and control system**

Applicable to the Reversal Project? YES

Changes to comply with this Mitigation Commitment during the Reversal Project? YES, see below.



Required Change	Status
Modify System Description Specifications in Mitigation Appendix – Item 13 (add Crude Oil in Leak Detection specifications) and send to PHMSA for approval	Completed February 14, 2012.

Actions required to comply with this Mitigation Commitment:

Required Action	Status
Review capabilities of leak detection system for crude oil	Completed January 2012.
Perform API 1149 study	Completed October 2011.
Configure PLDS for reversal and 60 minute window	Completed May 2012.

**4.14 MiC14: Perform close interval survey**

Applicable to the Reversal Project? NO

**4.15 MiC15: Perform engineering analysis on pipeline spans**

Applicable to the Reversal Project? NO

**4.16 MiC16: Remove all encroachments**

Applicable to the Reversal Project? NO

**4.17 MiC17: Clear right-of-way to excellent condition**

Applicable to the Reversal Project? NO

**4.18 MiC18: Inspect and repair or replace 26 locations identified by Williams**

Applicable to the Reversal Project? NO



**4.19 MiC19: Perform studies evaluating seven factors such as stress corrosion potential**

Applicable to the Reversal Project? NO

**4.20 MiC20: Increase frequency of patrols in Tier II and Tier III areas**

Applicable to the Reversal Project? NO

**4.21 MiC21: Increase frequency of inspections of pump stations and install remote cameras for monitoring stations**

Applicable to the Reversal Project? YES

Changes to this Mitigation Commitment required by the Reversal Project? NO

Actions required to comply with this Mitigation Commitment:

Required Action	Status
Install remote cameras for monitoring new stations	Installation and testing of cameras added to Pre-Startup Safety review (PSSR).

**4.22 MiC22/Mitigation Appendix Item 22: Quantify costs and benefits of install additional valves; install new check valves and relocate other check valves**

Applicable to the Reversal Project? YES

Changes to this Mitigation Commitment required by the Reversal Project? YES, see below.

Required Change	Status
Modify Item 22 and Mitigation Appendix – Item 22 to replace check valves with remote operated valves	Completed

Actions required to comply with this Mitigation Commitment:

Required Action	Status
Conduct surge analysis and propose potential solutions to mitigate potential surge conditions. Four recommendations for follow-up actions were identified.	Phase II surge analysis submitted to PHMSA on June 13, 2013. PHMSA approval was received July 24, 2013.



**4.23 MiC23/Mitigation Appendix Item 23, 24, & 26 (Enhanced Facility Response Plan): Develop response center in middle area of pipeline, address firefighting outside of metropolitan areas, revise facility response plan**

Applicable to the Reversal Project? YES

Changes to this Mitigation Commitment required by the Reversal Project? NO

Actions required to comply with this Mitigation Commitment:

Required Action	Status
Revise Facility Response Plan for crude oil.	Completed October 2012.
Revise plans and specifications for public water systems to ensure they meet EPA standards for benzene in the event of a spill	Completed October 2012.

**4.24 MiC24/Mitigation Appendix Item 23, 24, & 26 (Enhanced Facility Response Plan): Develop response center in middle area of pipeline, address firefighting outside of metropolitan areas, revise facility response plan**

See Mitigation Commitment 23.

**4.25 MiC25/Mitigation Appendix Item 25: Develop enhanced public education/damage prevention programs**

Applicable to the Reversal Project? YES

Changes to this Mitigation Commitment required by the Reversal Project? NO

Actions required to comply with this Mitigation Commitment:

Required Action	Status
Revise public education/damage prevention literature to include crude oil.	Completed November, 2012.



**4.26 MiC26/Mitigation Appendix Item 23, 24, & 26 (Enhanced Facility Response Plan): Develop response center in middle area of pipeline, address firefighting outside of metropolitan areas, revise facility response plan**

See Mitigation Commitment 23.

**4.27 MiC27: Provide evidence that secondary containment was installed for all storage and relief tanks**

Applicable to the Reversal Project? NO

**4.28 MiC28: Revise Facility Response Plan to make it consistent with City of Austin’s Barton Springs oil spill contingency plan and the US Fish and Wildlife Service’s Barton Springs Salamander Recovery Plan**

Applicable to the Reversal Project? YES

Changes to this Mitigation Commitment required by the Reversal Project? NO

Actions required to comply with this Mitigation Commitment:

Required Action	Status
Review Facility Response Plan for concurrence with City of Austin’s plan. Current FRP has been updated to be consistent with USFW BSS Recovery Plan.	Completed October 2012.

**4.29 MiC29: Conduct water quality monitoring at 12 locations**

Applicable to the Reversal Project? NO

**4.30 MiC30: Provide alternate water supplies to certain water municipalities**

Applicable to the Reversal Project? YES

Changes to this Mitigation Commitment required by the Reversal Project? NO

Actions required to comply with this Mitigation Commitment:

Required Action	Status
Review and revise water supply contingency plans as necessary.	Completed October 2012.



**4.31 MiC31: Perform surge analysis prior to any changes which can change surge pressures in system**

Applicable to the Reversal Project? YES

Changes to this Mitigation Commitment required by the Reversal Project? NO

Actions required to comply with this Mitigation Commitment:

Required Action	Status
Perform surge analysis between Crane and East Houston and between East Houston and Speed Junction.	Phase II surge analysis submitted to PHMSA on June 13, 2013. PHMSA approval was received July 24, 2013.
Submit surge analysis to PHMSA (concurrent with EA submittal) along with proposed mitigation measures.	Phase II surge analysis submitted to PHMSA on June 13, 2013. PHMSA approval was received July 24, 2013.

**4.32 MiC32: Perform pipe-to-soil potential surveys twice per year in Tier II and Tier III areas**

Applicable to the Reversal Project? NO

**4.33 MiC33: Establish an adequate refugium and captive breeding program for the Barton Springs salamander and perform conservation measures to mitigate potential impacts to threatened and endangered species from future construction activities**

Applicable to the Reversal Project? YES

Changes to this Mitigation Commitment required by the Reversal Project? NO

Actions required to comply with this Mitigation Commitment:

Required Action	Status
Review potential effects of construction activities and crude and revise existing plan as necessary.	Finding of No Significant Impact by PHMSA on December 27, 2012.



**4.34 MiC34: Implement system changes to limit surge pressures to no more than MOP in sensitive areas**

Applicable to the Reversal Project? NO

**4.35 MiC35: Longhorn shall not transport products containing MBTE**

Applicable to the Reversal Project? NO

**4.36 MiC36: Longhorn shall prepare site-specific environmental studies for any new pump stations**

Applicable to the Reversal Project? YES

Changes to this Mitigation Commitment required by the Reversal Project? NO

Actions required to comply with this Mitigation Commitment:

Required Action	Status
Include new pump stations for Phase II in EA.	Finding of No Significant Impact by PHMSA on December 27, 2012.

**4.37 MiC37: Longhorn shall maintain pollution liability insurance of no less than \$15 million**

Applicable to the Reversal Project? NO

**4.38 MiC38: Longhorn shall submit periodic reports to PHMSA about status of mitigation commitment implementation**

Applicable to the Reversal Project? YES

Changes to this Mitigation Commitment required by the Reversal Project? NO



Actions required to comply with this Mitigation Commitment:

Required Action	Status
Submit quarterly reports to PHMSA regarding status of Reversal Project, including Self Auditor’s progress report.	Magellan submits bi-weekly construction reports to PHMSA. Self Auditor submitted quarterly reports to Magellan during Phase I and this Phase II report.

**4.39 MiC39/Mitigation Appendix – Item 39/Mitigation Plan First Supplement: The Longhorn Mitigation Plan, Pipeline System Integrity Plan, and Operations Reliability Assessment shall not be unilaterally changed. The Longhorn Mitigation Plan may be modified only after changes have been reviewed and approved by PHMSA. Changes will be provided to the public by posting on the Magellan website and will be provided to the Lower Colorado River Authority and Cities of Austin, El Paso and Houston.**

Applicable to the Reversal Project? YES

Changes to this Mitigation Commitment required by the Reversal Project? NO

Actions required to comply with this Mitigation Commitment:

Required Action	Status
Submit any proposed changes to PHMSA, post on Magellan website and notify LCRA and Cities of Austin, El Paso and Houston.	Completed





## 5.0 Findings for the LMP Management Commitments

The 14 Management Commitments described in the LMP are addressed below.

### 5.1 MC1: Longhorn Pipeline System Integrity “Process Elements”

The first of the 14 Management Commitments addressed in this section of this report commits Longhorn to implement a System Integrity Plan (SIP) consisting of 12 “process elements” that are “over and above” the federal and state regulatory requirements. The 12 SIP elements are addressed in the next section of this report.

Applicable to the Reversal Project? YES

Changes to this Management Commitment required by the Reversal Project? NO

Actions required to comply with this Mitigation Commitment: See SIP elements in next section of report.

### 5.2 MC2: Data Gathering and Identification and Analysis of Pipeline System Threats

Applicable to the Reversal Project? YES

Changes to this Management Commitment required by the Reversal Project? NO

Actions required to comply with the Management Commitment:

Required Action	Status
As described in PE3 below, the risk model will be updated to reflect changes in flow direction, pump stations etc.	Completed

### 5.3 MC3: Integration of System-Wide Activities

Applicable to the Reversal Project? NO

### 5.4 MC4: Incorporation of Engineering Analysis

Applicable to the Reversal Project? YES



Changes to this Management Commitment required by the Reversal Project? NO

Actions required to comply with the Management Commitment:

Required Action	Status
External engineering experts will be used as needed for items such as surge analysis, analysis of the leak detection system and assistance in performing HAZOP and LOPA.	Completed.

**5.5 MC5: Integration of New Technologies**

Applicable to the Reversal Project? NO

**5.6 MC6: Root Cause Analysis and Lessons Learned Process/Incident Investigation Process**

Applicable to the Reversal Project? NO

**5.7 MC7: Use of Industry-Wide Experience**

Applicable to the Reversal Project? NO

**5.8 MC8: Resource Allocation**

Applicable to the Reversal Project? NO

**5.9 MC9: Workforce Development and Training**

Applicable to the Reversal Project? YES

Changes to this Management Commitment required by the Reversal Project? NO



Actions required to comply with the Management Commitment:

Required Action	Status
Employees will be trained in the hazards associated with crude products, specifically a four hour class in H <sub>2</sub> S safety, and will be provided with monitors for use in areas with H <sub>2</sub> S	Completed.
Guidance document for fixed H <sub>2</sub> S monitor placement will be developed.	Completed.
Training on changes in operations as a result of change in flow direction and crude vs. refined product.	Completed.

#### 5.10 MC10: Communication to Longhorn and Operations Management

This commitment is no longer relevant, since MPL both owns and operates the Longhorn pipeline system and there is no separate Longhorn management structure with which to communicate outside of MPL itself.

Applicable to the Reversal Project? NO

#### 5.11 MC11: Management of Change

Applicable to the Reversal Project? YES

Changes to this Management Commitment required by the Reversal Project? NO

Actions required to comply with the Management Commitment:

Required Action	Status
As noted in section PE7 of this report, all Reversal Project changes are reviewed by Asset Integrity Engineering and the appropriate stakeholders.	Ongoing. A separate tracking spreadsheet for the Reversal Project MOCs was developed in June 2012.

#### 5.12 MC12: Performance Monitoring and Feedback

Applicable to the Reversal Project? YES

Changes to this Management Commitment required by the Reversal Project? NO



Actions required to comply with the Management Commitment:

Required Action	Status
As noted in section PE12 of this report, Magellan will review the environmental assessment (EA) and identify if any changes in metrics are required as a result of the Reversal Project.	No changes in metrics were identified as needed.
Magellan has retained RCP Inc. to perform the self-audit to ensure compliance of all aspects of the Reversal Project with the LPSIP.	RCP Inc. provided quarterly reports during Phase I and this Phase II report.

**5.13 MC13: Self Audit**

Applicable to the Reversal Project? YES

Changes to this Management Commitment required by the Reversal Project? NO

Actions required to comply with the Management Commitment:

Required Action	Status
Magellan has retained RCP Inc. to perform the self-audit to ensure compliance of all aspects of the Reversal Project with the LPSIP.	RCP Inc. provided quarterly reports during Phase I and this Phase II report.

**5.14 MC14: Longhorn’s Continuing Commitment**

Magellan continues to implement the programs required by the LMP as evidenced by this audit for the Reversal Project.

Applicable to the Reversal Project? YES

Changes to this Management Commitment required by the Reversal Project? NO

Actions required to comply with the Management Commitment:

Required Action	Status
Magellan has retained RCP Inc. to perform the self-audit to ensure compliance of all aspects of the Reversal Project with the LPSIP.	RCP Inc. provided quarterly reports during Phase I and this Phase II report.



## 6.0 Findings for the 12 LPSIP Process Elements

The 12 process elements described in the LMP are addressed below.

### 6.1 PE1: Longhorn Corrosion Management Plan

Applicable to the Reversal Project? YES

Changes to this Management Commitment required by the Reversal Project? NO

Actions required to comply with the Management Commitment:

Required Action	Status
Magellan will review the current Longhorn internal corrosion management program and revise accordingly to address any changes needed to effectively address crude products.	Finding of No Significant Impact by PHMSA on December 27, 2012.

No changes are needed for the external corrosion management program.

### 6.2 PE2: In Line Inspection and Rehabilitation Program

Prescriptive tool inspections have been completed so are no longer applicable.

Applicable to the Reversal Project? YES

Changes to this Management Commitment required by the Reversal Project? NO

Actions required to comply with the Management Commitment:

Required Action	Status
The current Longhorn ILI program will be reviewed prior to start-up and revised if necessary to effectively address crude products.	Completed.

### 6.3 PE3: Key Risk Areas Identification and Assessment

Applicable to the Reversal Project? YES



Changes to this Management Commitment required by the Reversal Project? NO

Actions required to comply with the Management Commitment:

Required Action	Status
The risk model will be reviewed and revised prior to startup.	The risk model was updated and the run completed in May 2013.

**6.4 PE4: Damage Prevention Program**

Applicable to the Reversal Project? YES

Changes to this Management Commitment required by the Reversal Project? NO

Actions required to comply with the Management Commitment:

Required Action	Status
The damage prevention program literature for the Longhorn pipeline will be revised to include information about crude products. No other changes in the damage prevention program are needed	Completed November 2012.

**6.5 PE5: Encroachment Procedures**

Applicable to the Reversal Project? NO

**6.6 PE6: Incident Investigation Program**

Applicable to the Reversal Project? NO

**6.7 PE7: Management of Change**

Applicable to the Reversal Project? YES

Changes to this Management Commitment required by the Reversal Project? NO



Actions required to comply with the Management Commitment:

Required Action	Status
All Reversal Project changes are reviewed by Asset Integrity Engineering and the appropriate stakeholders. A preconstruction PHA and LOPA were performed for Odessa Station, the preliminary design for Crane Station was evaluated via PHA, and a pre-construction PHA was done for East Houston Inbound/Outbound. Magellan has implemented a separate tracking spreadsheet to track MOCRs for the Reversal Project.	Action items identified in PHAs and LOPAs are tracked in Magellan’s CMS.

**6.8 PE8: Depth of Cover Program**

Applicable to the Reversal Project? YES

Changes to this Management Commitment required by the Reversal Project? NO

Actions required to comply with the Management Commitment:

Required Action	Status
No depth of cover issues were initially planned to be addressed as part of the Reversal Project.	No Depth of Cover projects were identified by Magellan.

**6.9 PE9: Fatigue Analysis and Monitoring Program**

Applicable to the Reversal Project? YES

Changes to this Management Commitment required by the Reversal Project? NO

Actions required to comply with the Management Commitment:

Required Action	Status
The fatigue analysis and monitoring program model will be updated to reflect the flow reversal, changes in pressure profiles, etc.	No changes required.



### 6.10 PE10: Scenario Based Risk Mitigation Analysis

Applicable to the Reversal Project? YES

Changes to this Management Commitment required by the Reversal Project? NO

Actions required to comply with the Management Commitment:

Required Action	Status
As noted in PE3, the risk model will be reviewed and revised prior to startup.	The risk model was updated and the run completed in May 2013.

### 6.11 PE11: Incorrect Operations Mitigation

Applicable to the Reversal Project? YES

Changes to this Management Commitment required by the Reversal Project? NO

Actions required to comply with the Management Commitment:

Required Action	Status
Magellan has followed the Design Index portion of this program by conducting HAZOPs and LOPA for the specific sub-projects of the Reversal Project such as the Odessa Station and Crane Station.	Ongoing. HAZOPs and LOPAs were done for all of the pump stations in Phase II. All action items from HAZOPs and LOPAs are entered into Magellan’s CMS for tracking.
The Construction Index portion of Incorrect Operations Mitigation pertains to new construction and to system modifications. This includes the use of qualified inspectors, materials that conform to specifications, backfilling procedures, material handling and pipe coating.	Ongoing.
The Maintenance Index portion of Incorrect Operations Mitigation pertains to ongoing maintenance. For the Reversal Project, any changes in maintenance procedures must be documented, and employees trained on changes, prior to placing the pipeline in service.	Changes to procedures are included as part of the Management of Change process.
The Operations Index pertains to items such as	Changes to operating procedures are included





<p>operating procedures, SCADA/Communications, safety, and training.</p>	<p>as part of the Management of Change process. SCADA changes should be covered under Magellan’s Control Room Management Plan.</p> <p>During Phase I, RCP recommended that some process be developed to track compliance with this Process Element for the Reversal Project. The scope of the project as well as the number of individuals involved in it could result in items being overlooked.</p>
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**6.12 PE12: System Integrity Plan Scorecarding and Performance Metrics Plan**

Applicable to the Reversal Project? YES

Changes to this Management Commitment required by the Reversal Project? NO

Actions required to comply with the Management Commitment:

<b>Required Action</b>	<b>Status</b>
<p>Magellan will review the environmental assessment (EA) and identify if any changes in metrics are required as a result of the Reversal Project.</p>	<p>The EA was reviewed and no changes in metrics were identified.</p>
<p>Magellan has retained RCP Inc. to perform the self-audit to ensure compliance of all aspects of the Reversal Project with the LPSIP.</p>	<p>RCP Inc. provided quarterly reports during Phase I and this Phase II report.</p>



## 7.0 Station Matrices

Shown as Exhibit 1 is the matrix of action items required to ensure compliance with the SIP for the applicable pump stations. Once all action items for a station are completed and reviewed by the auditor, the station can be started up.

The first station to be placed in service is Cartman. The completed matrix for Cartman is attached as Exhibit 2. All items are complete, indicating compliance with the SIP for Cartman Station.

As additional stations are ready to be placed into service, the applicable matrices will be completed and sent to MMP, indicating compliance with the SIP.