

MAINTENANCE OF THE DEACTIVATED LINE

The out-of-service 24-inch sections of the Trans Mountain Pipeline and any other pipe segments considered inactive are included as part of Trans Mountain's ongoing Integrity Management Program.

In anticipation of future growth, Trans Mountain took measures to promote the long-term integrity of the deactivated segment to maintain the potential for its future reactivation, including:

- Removing oil from the pipe
- Isolating the segment of pipe through the installation of weld caps
- Filling the pipe with low pressure nitrogen gas to prevent internal corrosion
- Maintaining the cathodic protection system to prevent external corrosion
- Maintaining the Damage Prevention Program, which includes One-Call, aerial patrol and inspection of all ground disturbance activities near the 24-inch pipe
- Continuing to manage and monitor natural hazard threats such as low depth of cover at river crossings, scour and bank erosion and areas susceptible to ground movement

This means the inactive segments are continuously protected against external corrosion with the same level of cathodic protection as maintained on the entire pipeline system. The cathodic protection system uses an electric current induced onto the surface of the pipeline to minimize corrosion growth rates on the surface of the pipe. The inactive segments are also charged with nitrogen internally which maintains an inert environment and protects against internal corrosion.



REACTIVATION PROGRAM

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|-------------------------------------|---|
| Pump Station Works | <ul style="list-style-type: none"> • Installation of temporary scraper traps and valves at Hinton Pump Station, Hargreaves Trap site, Darfield Pump Station and Black Pines Pump Station • Installation of temporary bypass piping at the Jasper Pump Station • Installation of pipe at the former Yellowhead Station in Mount Robson Provincial Park |
| Operations and Maintenance Programs | <ul style="list-style-type: none"> • A comprehensive inline inspection (ILI) program • An integrity dig and repair program • A pipeline sleeve removal program • A hydrostatic testing recertification program • A natural hazard remediation and crossing upgrade program • Remove and replace small fittings and rethread one additional in Jasper National Park • A railway crossing pipeline replacement in Jasper National Park |
| Valve Works | <ul style="list-style-type: none"> • Installation of additional mainline check valves as well as manual and automated block valves • Automation of a selection of existing manual mainline block valves • Inspection and refurbishing of all mainline block valves |
| Access Works | <ul style="list-style-type: none"> • Installation of temporary access bridges • Installation of temporary highway access ramps • Installation of temporary vehicle railway crossings • Access trail improvements |



Trans Mountain has committed to completing in-line inspections (ILI) on the deactivated pipeline prior to placing the line back in service. This work is expected to begin in the spring of 2017.

ILI tools or “smart pigs” form the foundation of anomaly detection, investigation and pipeline repair programs. A complement of smart tools is used to detect a variety of pipeline defects. Up to five ILI tools will be passed through each section.



The tools will include:

- An initial cleaning tool in combination with a caliper tool to detect any impediments and ensure that the ILI tools can successfully navigate a pipeline segment
- Magnetic Flux Leakage (MFL) tools detect metal loss from corrosion
- Geometry tools detect pipe deformation and mechanical damage such as dents and gouges
- Electro-Magnetic Acoustic Transducer (EMAT) tools detect cracks

Preparing for ILI at Jasper Pump Station

In order for the ILI tool to pass through the Jasper Pump Station without interrupting the operation of the station, approximately 175 m of new 24” pipe is to be installed between the station isolation valves in a combination of buried piping (permanent) and surface piping (temporary). The buried portions will remain in place for final tie-in of the pump station. The surface portion will be removed after the hydrostatic testing has been completed. All activities related to the installation of the surface and buried piping will be confined within the existing fenced area of the Jasper Pump Station.

HYDROSTATIC TESTING PRIOR TO REACTIVATION

- A hydrostatic test is a well-established industry procedure for ensuring the safety and integrity of a pipeline, and is used to confirm the ability of a pipeline to operate safely
- A hydrostatic test occurs when a section of pipe is filled with water. The water is pumped up to a pressure higher than the normal operating pressure and then held at the higher pressure for a period of time to test the strength of the pipe.
- The purpose of a hydrostatic test is to detect any abnormalities that may exist in the pipeline. If defects exist, hydrostatic testing may cause a leak to occur with water in the pipeline instead of during normal operations when petroleum product runs through the pipeline.
- Hydrostatic testing serves as a confirmation of the ability of deactivated segments of the Trans Mountain Pipeline to operate safely and will be used to re-establish the maximum Licensed Operating Pressure of deactivated segments which is filed with the National Energy Board
- The operating conditions and pressures of the reactivated pipeline will be very similar to those that existed prior to deactivation in 2008
- As a precautionary measure, Trans Mountain will inspect reactivated segments of the pipeline, within the first two years of operation, with a high-resolution crack detection tool

Public safety and Hydrostatic Testing

The safety of the public and workers during the test is Trans Mountain's first priority. To ensure public safety, access will be restricted to the sections of the pipeline right-of-way where the hydrostatic testing is being performed. Temporary road and trail closures will be in effect for the duration of the test. Aerial and ground patrols and extra signage posted in the area will be used to ensure the public is guided to stay away from the pipeline sections under test. As a routine safety measure, mobile environmental protection units, as well as pipeline maintenance and response crews will be on standby at key locations along the test segment.

VALVE SITE LOCATIONS: HINTON TO HARGREAVES

- All existing valves will be inspected – some will need to be refurbished or replaced
- Proposed isolation valve automation and additions seek to strike balance between spill volume reduction and minimizing disturbance due to added infrastructure (valve sites, roads, power lines, etc.)
- Addition of four new automated valves, five new check valves and one new manual valve

| Kilometre Post | Status | Name or Location | Valve Type |
|-----------------------------|----------|--|----------------|
| Hinton to Hargreaves | | | |
| KP 317.8 | Existing | Hinton Pump Station | Automated MLBV |
| KP 317.8 | Existing | Hinton Pump Station | Check Valve |
| KP 317.8 | New | Hinton Pump Station | Manual RMLBV |
| KP 327.1 | Existing | Fiddle River (existing manual valve to be automated) | Automated MLBV |
| KP 336.3 | Existing | Pocahontas | Manual MLBV |
| KP 339.3 | Existing | Celestine Lake Road | Manual MLBV |
| KP 339.4 | New | Celestine Lake Road (co-located with existing manual valve) | Check Valve |
| KP 343.6 | New | North Jasper Lake | Check Valve |
| KP 353.8 | New | South Jasper Lake (co-located with NPS 36 automated valve on Line 2) | Automated MLBV |
| KP 360.1 | Existing | Snaring River | Manual MLBV |
| KP 369.5 | Existing | Jasper Pump Station | Automated MLBV |
| KP 369.5 | Existing | Jasper Pump Station | Check Valve |
| KP 383.4 | New | Downstream Miette River | Check Valve |
| KP 390.6 | Existing | Miette River No. 3 | Manual MLBV |
| KP 390.6 | New | Miette River No. 3 (co-located with existing manual valve) | Check Valve |
| KP 396.8 | Existing | Miette River No. 5 (Decoigne) | Manual MLBV |
| KP 405.9 | Existing | Yellowhead | Manual MLBV |
| KP 416.4 | Existing | Yellowhead Creek (Baxter) | Manual MLBV |
| KP 423.9 | Existing | Fraser River No. 2 | Manual MLBV |
| KP 428.8 | Existing | Grant Brook (existing manual valve to be automated) | Automated MLBV |
| KP 433.6 | Existing | Moose River | Manual MLBV |
| KP 433.6 | New | Moose River (co-located with existing manual valve) | Check Valve |
| KP 457.5 | New | Fraser River (co-located with NPS 36 automated valve on Line 2) | Automated MLBV |
| KP 461.1 | Existing | Fraser River No. 7A (existing manual valve to be automated) | Automated MLBV |
| KP 461.2 | Existing | Fraser River No. 7B | Manual MLBV |
| KP 470.6 | New | Hargreaves (co-located with new trap site) | Automated MLBV |