



CP Styrene Derailment

Canadian Pacific Railway Emergency Response

Presented By:
Bonni Campbell | CP
Alec Mackenzie | GHD
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Overview

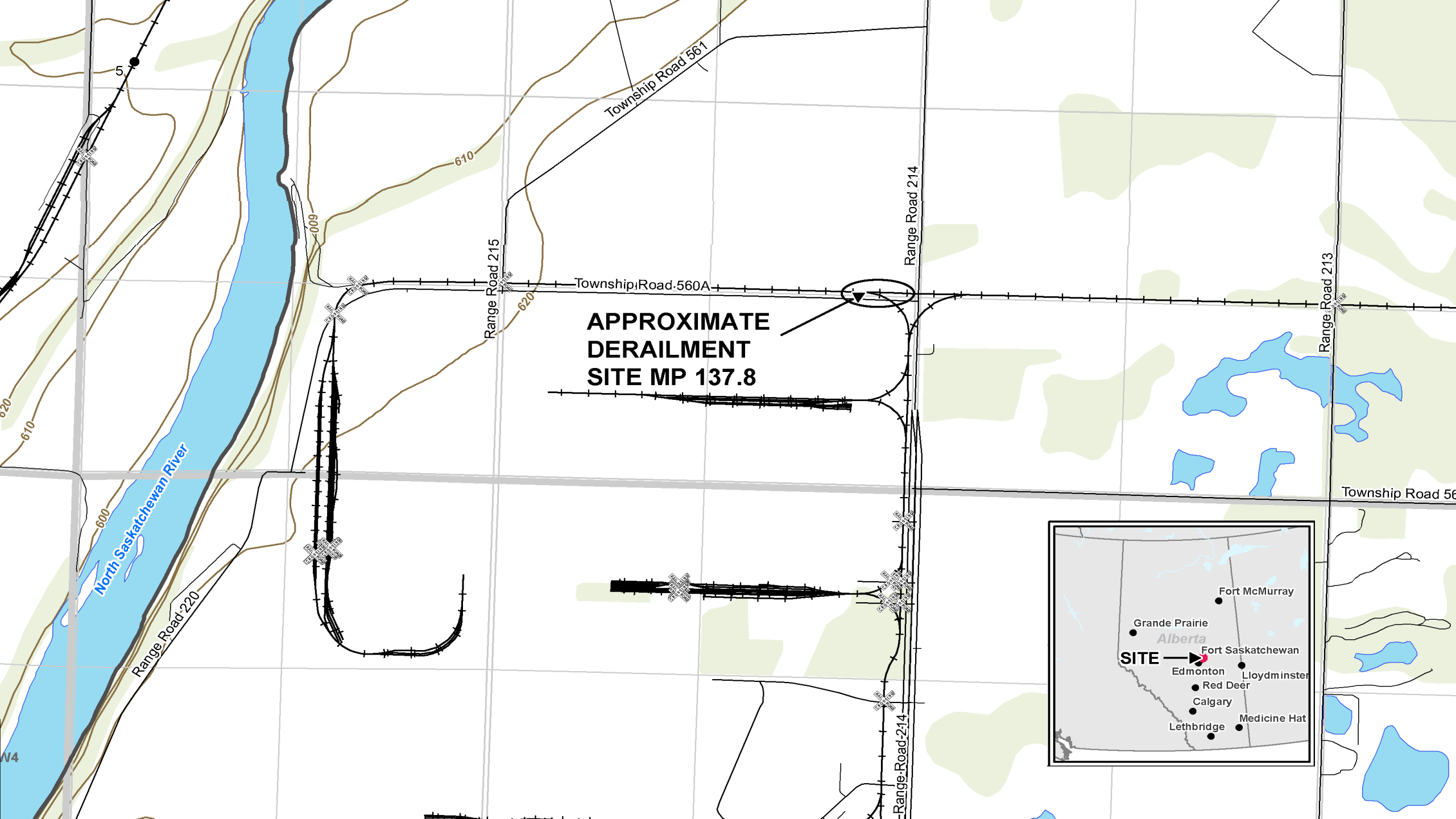
- Introduction
- Emergency Response
- Logistical Challenges
- Remedial Options
- Thermal Treatment
- Water Treatment System
- Restoration



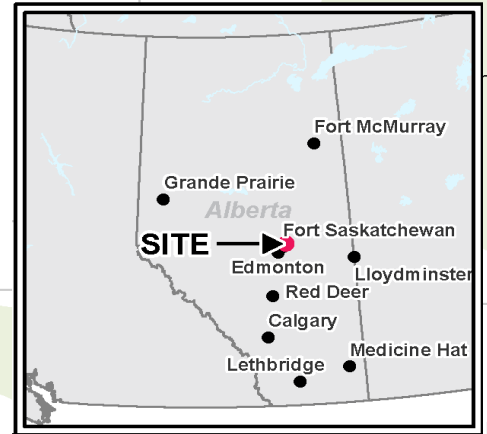
Site History – Mile Point 137.8 Scotford Subdivision

- Occurred **December 8, 2015**
- **Four tank cars** derailed near Fort Saskatchewan, Alberta
- Estimated 90,000 L of styrene monomer released
- Product released directly into ditch south of the rail line
- CP Emergency Response crew was deployed immediately





**APPROXIMATE
DERAILMENT
SITE MP 137.8**



Emergency Response

- CP ER Experts Mobilized
- Incident Command System (ICS) Initiated
- First Responders (CP Police, Shell, Strathcona Fire)
- Emergency Air Monitoring
- Product Containment
- Product Recovery
- Product Transfers
- Site Characterization
- Track Repair



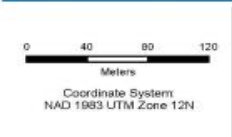
Logistical Challenges

- High levels of styrene vapours
 - Respirators or SCBA
 - 24-hr continuous air monitoring
- Limited space in CP ROW
- Shallow groundwater
- Scotford upgrader turnaround
- Coordination with stakeholders (CP, Shell, City of Fort Saskatchewan, AEP)





Sources: Atlas 15 2015, CanVec Edition 1.1, © Department of Natural Resources Canada, all rights reserved, National Road Network 2.0, GeoBase, National Railway Network (NRRN) - Natural Resources Canada, Earth Sciences Sector, Canada Centre for Mapping and Earth Observation, published 2013-05-10; Aerial Image: Strathcona County, ERJ01 - Strathcona, 2013 10cm Orthoimagery, accessed via ESRI World Imagery service.



DRAFT



CP DERAILMENT
SCOTFORD SUBDIVISION
FORT SASKATCHEWAN, ALBERTA

AERIAL IMAGE

Dec 9, 2015

FIGURE 3

Remedial Options

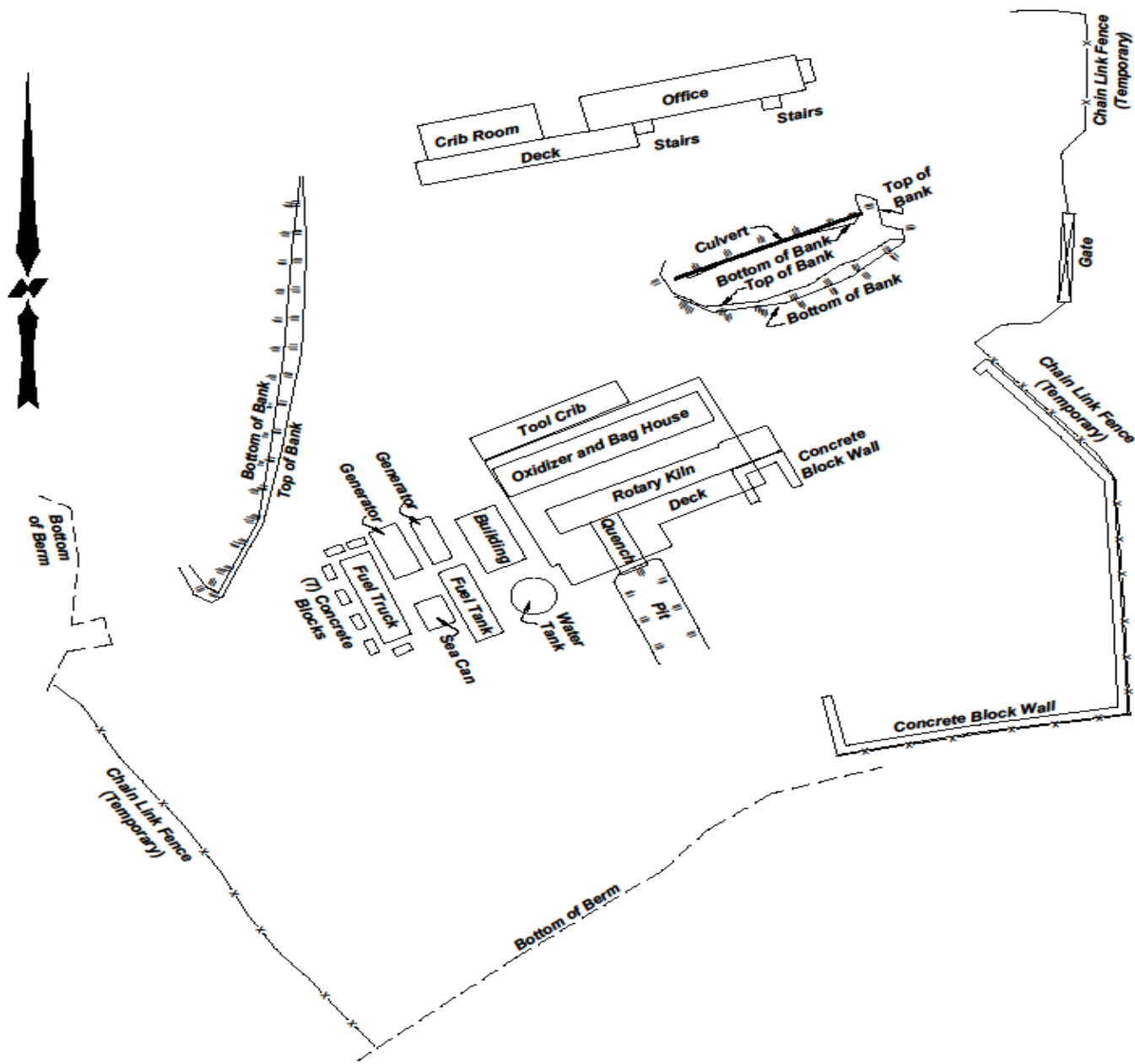
- Feasibility study
 - Disposal
 - Aeration
 - Degradation
 - Chemical Oxidation
 - RemBind
 - Thermal Desorption
- Bench scale treatability assessment
 - Chemical Oxidation and RemBind
- Limited disposal options due to high concentration of styrene (Class I)
- Access agreement brokered with a neighboring landowner and AEP



Thermal Treatment

- Thermal desorption selected as preferred option
- Styrene concentration 50000 mg/kg
- Remediation criteria 0.68 mg/kg
- 10-20 tonnes/hr
- Treated soil reused as backfill on-site once confirmed to be clean
- QA/QC process required





Water Treatment System

- Dewatering required to complete soil excavation
- Water was collected and treated by a mobile treatment system prior to discharge
- Water treatment included:
 - Flocculation
 - Sedimentation
 - Two-stage media filtration (activated carbon)
- In-situ groundwater collection system installed



Restoration

- Site restoration program completed in October 2016
- Remediation and restoration activities are ongoing
 - Groundwater monitoring program
 - Feasibility study for residual impacts



Questions?

