



# Drainage Improvements & Embankment Protection

PROJECT FACTS

## Project Scope

The Alaska Railroad (ARRC) will repair or replace up to 15 culverts along the northern half of the railroad corridor. Several culverts in this area are at risk of washout, collapse or clogging. ARRC is also pursuing embankment protection and flooding mitigation efforts, which involve installing riprap and armor rock to fortify areas that are susceptible to high-water events, including flooding.

## Benefits

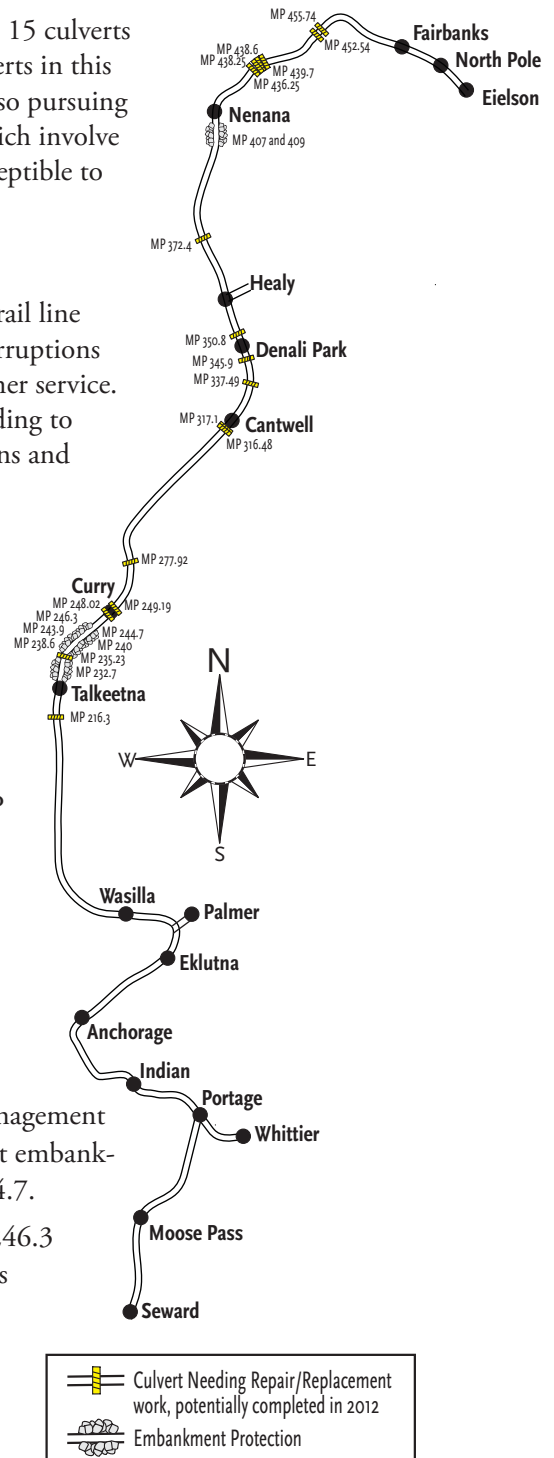
Pre-emptive infrastructure maintenance will help avoid rail line outages. Pro-actively tackling potential causes of service interruptions will benefit rail-based state commerce and overall rail customer service. The railroad will also avoid the much higher costs of responding to emergency outages that may occur in poor weather conditions and at inconvenient hours.

## Status

- Materials procured in 2011 and 2012.
- Railroad Maintenance of Way crews replaced eight culverts on the south end (between MP 18 and 21) in 2011. Up to 15 culverts throughout the northern half of the railroad will be replaced in 2012.
- Embankment protection projects were completed at MP 238.7, 247.4, 248.8 and 252 in 2011. Embankment protection work at 232.7, 238.6, 240, 243.9, 244.7, 246.3, 407 and 409 is scheduled during 2012.

## Project Costs

- Culvert repair/replacement and drainage improvement budget is \$500,000, funded 100% by ARRC.
- Approximately \$1.26 million in Federal Emergency Management Agency (FEMA) grants is anticipated in 2012 to support embankment protection work at MP 238.6, 240, 243.9 and 244.7.
- Embankment protection at ARRC MP 232.7 and MP 246.3 are supported by \$1.26 million from 2011 FEMA grants funded 75% by the and 25% by ARRC.
- Embankment protection at ARRC MP 407 and 409 is supported by \$446,000 in 2011 grants funded 80% by the Federal Railroad Administration (FRA) and 20% by ARRC.

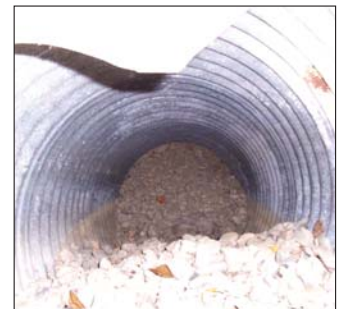


## Embankment Protection and Fortification Efforts



Riprap and armor rock are placed at areas along the Susitna River (ARRC MP 239 and 247) that are impacted by scour, ice flow and flooding. In 2012, the Alaska Railroad will pursue similar embankment protection at several locations along the Susitna River, between ARRC MP 232 (about 6 miles north of Talkeetna) to ARRC MP 247 (near Curry).

## Improved Drainage Through Culvert Repair or Replacement



MP 350.8 culvert is blocked.



Culvert replacement at ARRC MP 18.66, one of 8 culverts replaced on the south end in 2011. MP 372.4 culvert almost blocked.

Culverts are made of sections spliced together by banding. Over years, heavy trains, high water flows and corrosion take a toll on the banding and ballast/embankment is able to leak through. Eventually the culvert's integrity is compromised.