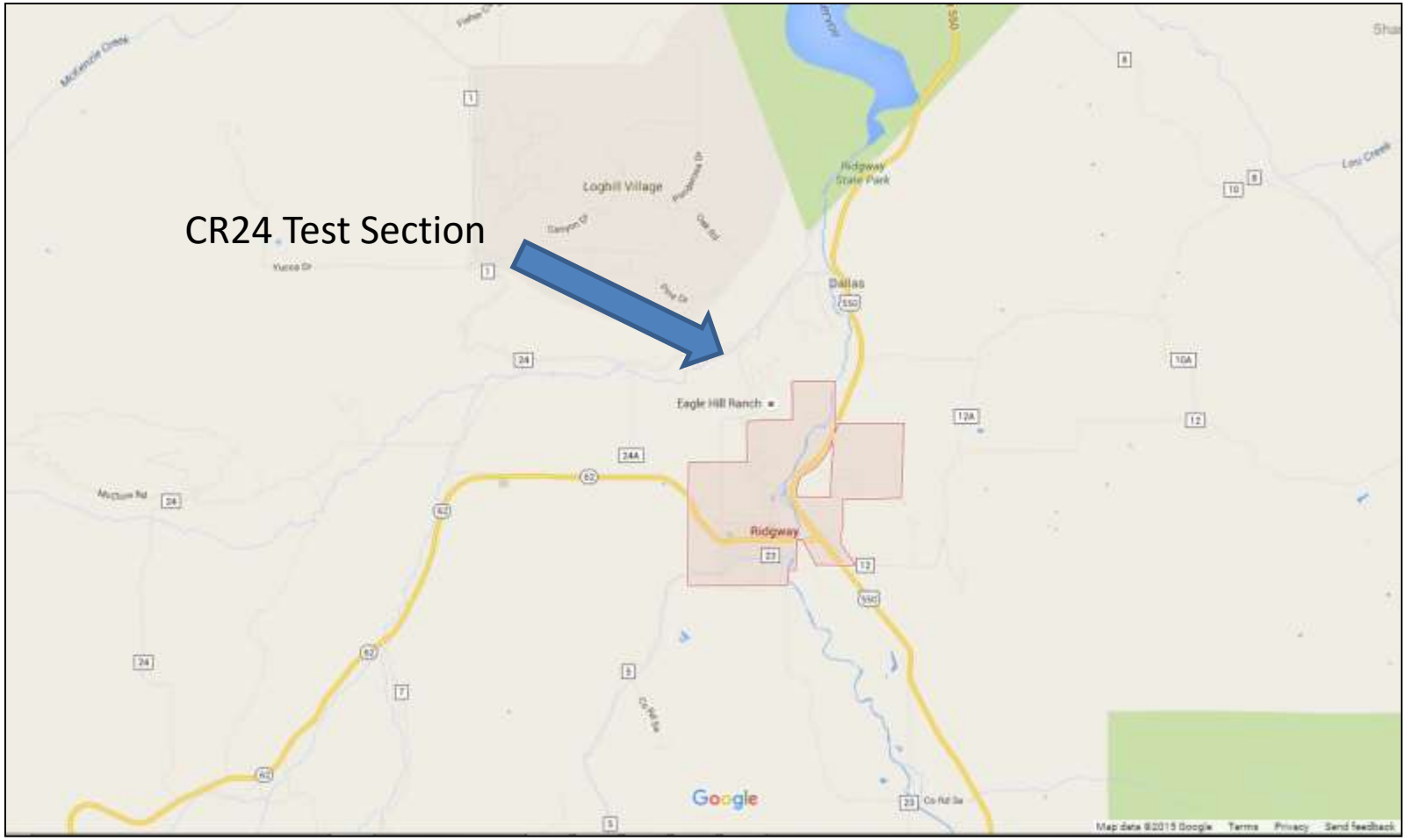
Ouray County

County Road 24 Test Section – Dallas Roadway Products
One-Year Review

Shane Duckworth, P.E., P.Eng.
Backcountry Design Group, LLC

BACKCOUNTRY DESIGN GROUP, LLC

KEY PLAN



BACKCOUNTRY DESIGN GROUP, LLC

SITE PLAN

BACKCOUNTRY DESIGN GROUP, LLC

PRE-EXISTING CONDITIONS (1 of 2)

PRE-EXISTING CONDITIONS (2 of 2)

POST-INSTALLATION CONDITIONS (1 of 4)

POST-INSTALLATION CONDITIONS (2 of 4)

POST-INSTALLATION CONDITIONS (3 of 4)

POST-INSTALLATION CONDITIONS (4 of 4)

(2016-12-02)

EXISTING CONDITIONS (1 of 4)

EXISTING CONDITIONS (2 of 4)

EXISTING CONDITIONS (3 of 4)

EXISTING CONDITIONS (4 of 4)

COMMENT! - EXISTING CONDITIONS (4 of 4)

Figure 15. The east-bound lane after grading and compaction; most of the east two-thirds of the test section compacted well; some bridging of the road by the vibratory compactor steel drum can be seen in the center foreground, resulting in some looser material in a slight depression. This will cause preferential surface flow of water and promote erosion here unless corrected by fine surface regrading.

COMPARISON TO ADJACENT SECTIONS - EAST

2016-02-10

COMPARISON TO ADJACENT SECTIONS - EAST

2016-07-14

COMPARISON TO ADJACENT SECTIONS - EAST

2016-08-01

COMPARISON TO ADJACENT SECTIONS - EAST

2016-08-09

COMPARISON TO ADJACENT SECTIONS - EAST

2016-08-22

COMPARISON TO ADJACENT SECTIONS - EAST

2016-08-30

COMPARISON TO ADJACENT SECTIONS - EAST

2016-11-10

COMPARISON TO ADJACENT SECTIONS - WEST

2016-08-01

COMPARISON TO ADJACENT SECTIONS - WEST

2016-08-09

COMPARISON TO ADJACENT SECTIONS - WEST

2016-08-22

COMPARISON TO ADJACENT SECTIONS - WEST

2016-08-30

BACKCOUNTRY DESIGN GROUP, LLC

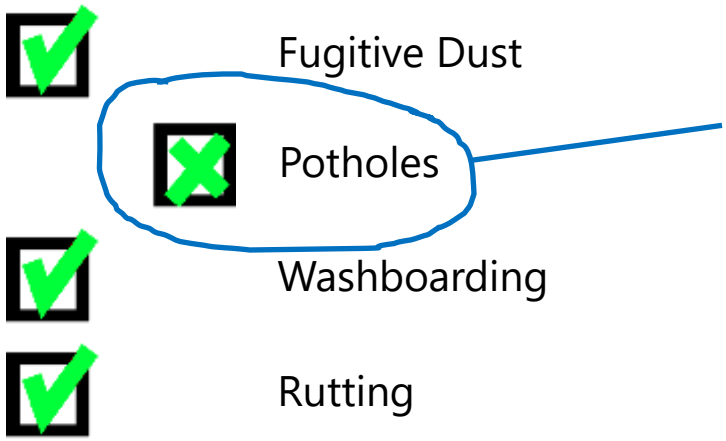
COMPARISON TO ADJACENT SECTIONS - WEST

2016-11-10

BACKCOUNTRY DESIGN GROUP, LLC

ONE-YEAR REVIEW:

DID DALLAS ROADWAY PRODUCTS MEET THE OBJECTIVES?



Due to initial compaction – Requires recompaction in area of potholing – not a product failure

ONE-YEAR REVIEW:

DID DALLAS ROADWAY PRODUCTS MEET THE FINANCIAL GOAL?

Proposal Construction Costs: $5,000

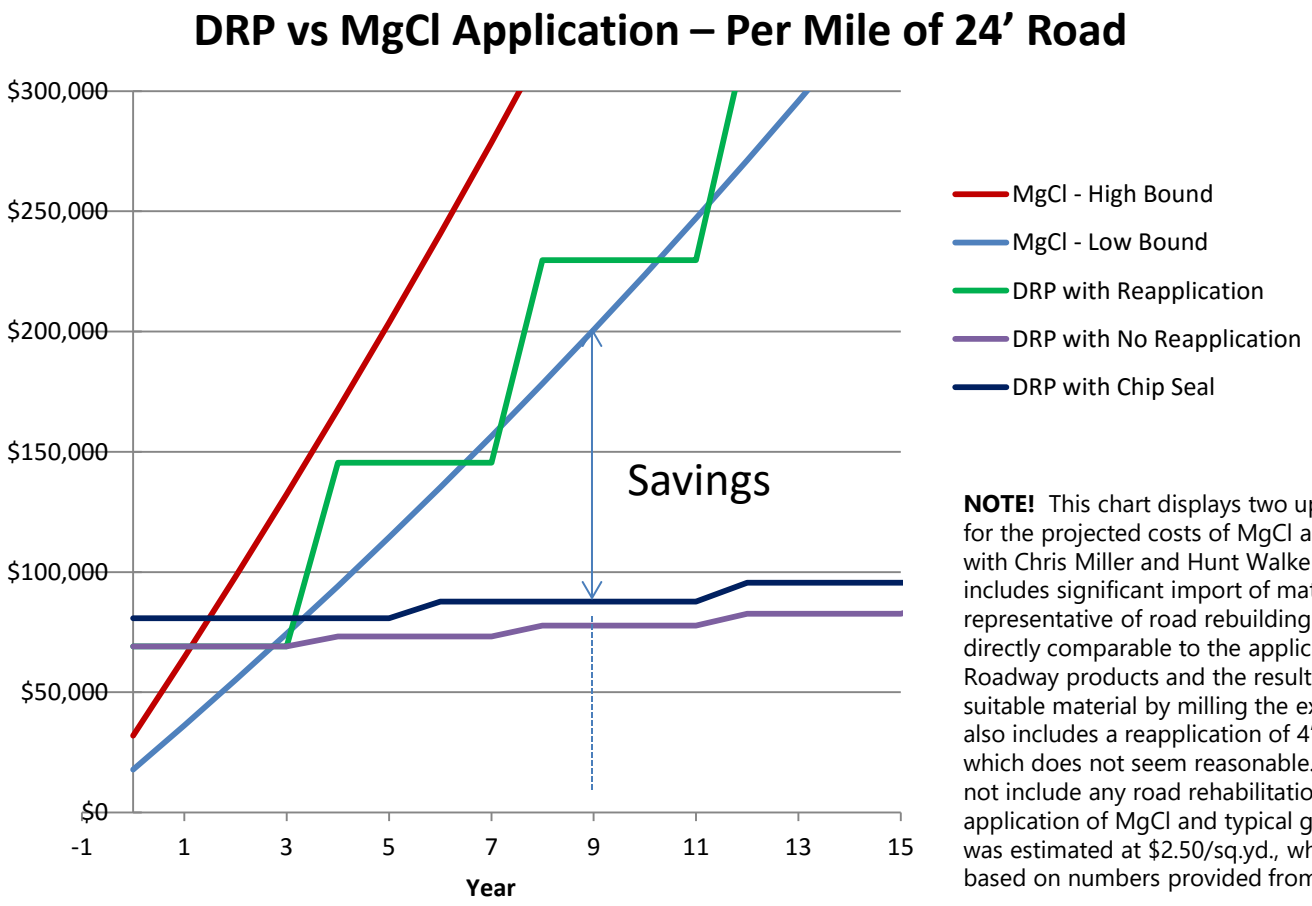
Bentonite Placement:	$580
Nov. 3 Construction:	$820
Nov. 9 Construction:	$1,765
Nov. 10 Drying Out:	$1,324
	$4,489

(or **$2,345** if equipment breakdown and drying out are ignored)

BACKCOUNTRY DESIGN GROUP, LLC

ONE-YEAR REVIEW:

DID DALLAS ROADWAY PRODUCTS MEET THE FINANCIAL GOAL?



NOTE! This chart displays two upper and lower bounds for the projected costs of MgCl application, as discussed with Chris Miller and Hunt Walker. The High Bound includes significant import of material that would be representative of road rebuilding (which would be more directly comparable to the application of Dallas Roadway products and the resulting in-place creation of suitable material by milling the existing road); it however also includes a reapplication of 4" of gravel per year which does not seem reasonable. The low bound does not include any road rehabilitation, just simply the application of MgCl and typical grading. The chip seal was estimated at $2.50/sq.yd., which appears to be low based on numbers provided from recent bids by GMCO.

What is Next?

RECOMMENDATIONS FOR ACHIEVING LONG-TERM R&B SUCCESS

- Catalog road information and issues by mile marker
  - Database should include subgrade information, if available
- Determine historic maintenance costs by section
  - Determination should highlight specific incremental events
- Develop database of solutions available (must determine efficacy!)
  - Initially, desk study
  - Secondarily, field trials – should be engineered for quantitative data
- Develop costing tools to enable long-term comparison of "do nothing" versus identified solution(s)
  - This will help guide CapEx
- Execute!

Thank you!

Shane Duckworth, P.E., P.Eng.

+1 970 239 1305
shane@backcountrydesigngroup.com

BACKCOUNTRY DESIGN GROUP, LLC