Public/Private Partnerships

King Coal Highway

Red Jacket Project

Federal Highway Administration

August 4, 2005

Charleston, West Virginia

Presentation Organization

- Ed Compton – FHWA, WV Division - Planning and Environment Team Leader
  - Introduction
  - Definitions and Benefits of Public/Private Partnerships
  - Red Jacket (King Coal) Concept Development
  - Dynamic Compacting Testing Evaluation
  - Specification Development
  - Current Construction

Public/Private Partnerships
Definitions
and
Benefits

What is a PPP?

- Public-private partnerships" (PPP) refer to contractual agreements formed between a public agency and private sector entity that allow for greater private sector participation in the delivery of transportation projects.

Where are PPPs being done?

- Twenty-three (23) States have legislation specifically allowing or encouraging PPPs for highway projects.
- Twenty-eight (28) States permit Design/Build procurement method for highway projects.

West Virginia Facts

- State Law Prohibits Design/Build Contracting for Highway Projects
- No State Law Encouraging PPPs
- Low Traffic Volumes and High Initial Construction Costs Limit Tolling Opportunities

The inability to allow design/build contracting, the lack of a state law specifically permitting public/private partnerships, and the low traffic volumes and high construction costs did not appear to make West Virginia a good candidate for these initiatives.

UNTIL ……

- A combination of rare and unique factors combined to form a opportunity to construct a portion of the King Coal highway in cooperation with a local coal company – the section of the King Coal Highway has become known as the Red Jacket Project.

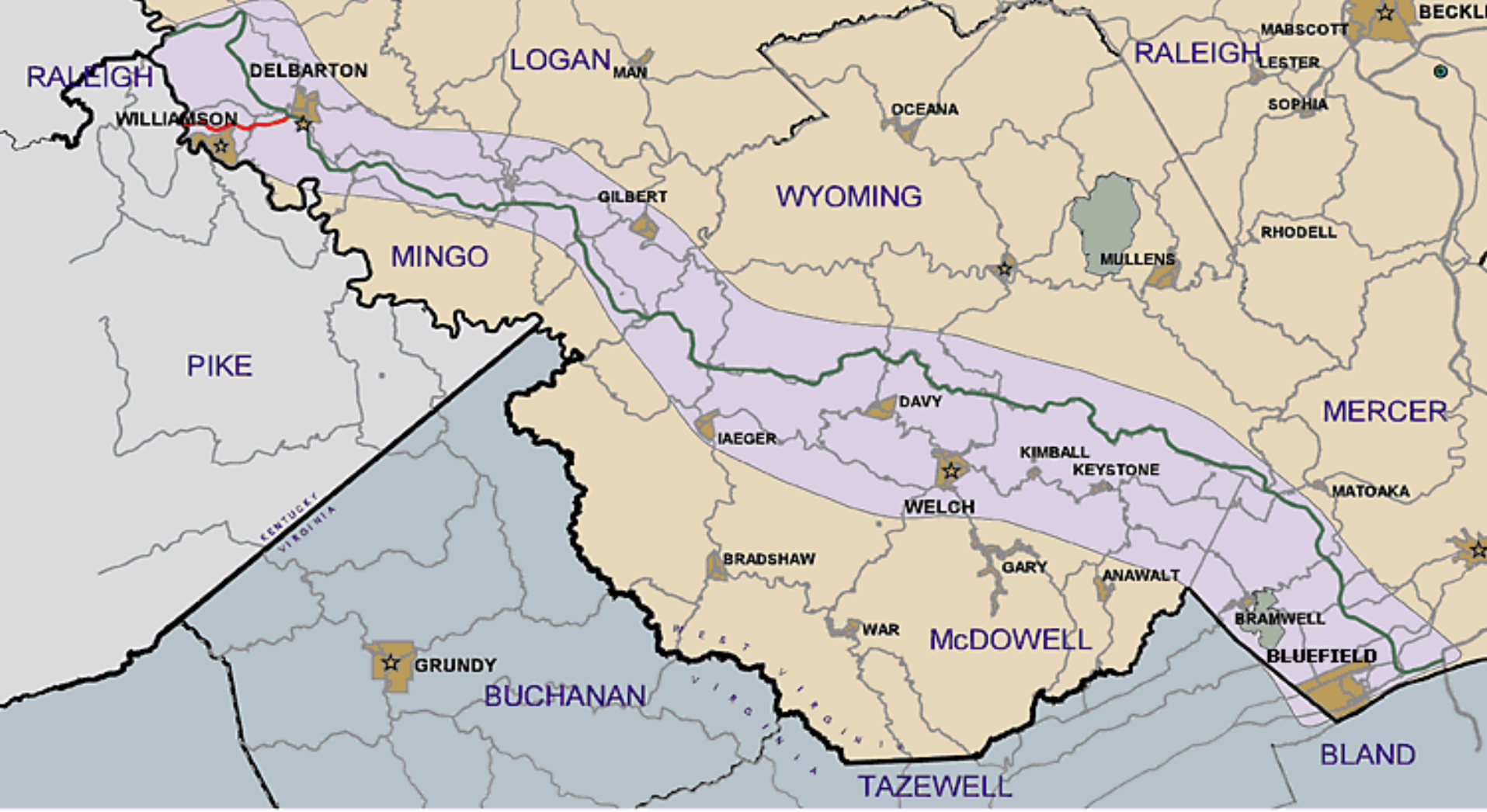
King Coal Highway

(Red Jacket Project)

Concept Development

King Coal Highway - Overview

- ISTEA (1992) – High Priority Corridor on NHS
- Follows US 52 corridor between Bluefield and Williamson
- Length – 93 miles
- Estimated Construction Costs - $1.6 billion in 2000 dollars
- Record of Decision approved in 2000
- Funding has been incremental – progress being made – although slowly



LEGEND

- Recreation Areas
- King Coal Highway Preferred Alternative
- Williamson Connector
- Incorporated Areas
- State Parks
- Study Area
- County Seat

N W E S

5 0 5 Miles

5 0 5 10 15 Kilometers

KING COAL HIGHWAY PREFERRED ALTERNATIVE

WVDOT DIVISION OF HIGHWAYS

Baker CHARLESTON, WV

Red Jacket Project
Concept Development

- Based on experience and engineering judgment – normal valley fills would not be acceptable for highway construction

- Strip mine highwalls adjacent to a highway would not be acceptable due to rock fall and safety concerns


END DUMP VALLEY FILL

Stepped Fill Construction

Red Jacket Project
Concept Development

- After further review and analysis – the fill construction techniques employed by this coal operator were determined to be acceptable.

- Cut design will conform with standard WVDOH specifications

DECISION DOCUMENT DEVELOPMENT

DECISION DOCUMENT

Public Interest/Cost Effectiveness

Potential Savings of between $193 and $170 million

Cost Effective?

COST COMPARISION				
Contracting Method	Estimated Cost for Engineering/Construction	Estimated Costs for R/W & Utilities	Estimated Costs for Pavement & Minor Drainage	Total Cost Estimate
Traditional	$285	$4.7 million	$49.4 million	$339.1 million
Negotiated Contract (low)	$92 million	$4.7 million	$49.4 million	$146.1 million
Negotiated Contract (high)	$115 million	$4.7 million	$49.4 million	$169.1 million

DECISION DOCUMENT

Total cubic yards estimated to be moved

59,249,632

Total cost per cubic yard to taxpayer

Between $1.29/cyd and $1.68/cyd

Fixed priced for six years – based on independent analysis of available coal reserves confident final price will be at low end of estimate

DECISION DOCUMENT

Quality Control/Inspection

- Fill construction acceptable
- Cut construction acceptable
- Special provisions would be developed as necessary
- Full time WVDOH inspection

Decision Document Finalization

With all the major questions answered, the design and construction process found to be acceptable and the project determined to be cost effective the Federal Highway Administration approved a Public Interest Finding on June 29, 2004

Red Jacket Project Engineering Issues

December 2003 Field Trip

- Toured fills already completed at Twisted Gun Golf Course (relocated CR 10)
- Toured fills under construction (fills up to 400’ high with 50’ benches)
- Fills under construction were being placed by the stepped fill (terraced) method

Concerns?

- 50’ lifts?!?
- FHWA Geotechnical experts initially felt that the stepped-fill placement method was not satisfactory
- Future settlement problems
- Long-term maintenance issues

Proposed Evaluation Plan – March 2004

Existing Fills

1. Conduct 3 Dynamic Compaction Test Sections on completed rock fills

- a. Contractor's (coal company) method, recent fill
- b. Contractor's (coal company) method, fill in place for at least one year
- c. State Method (modified rock fill placement and compaction procedure)

Parties Involved

- Nicewonder Contracting, Inc. - contractor
- Gannett Fleming, Inc.- designer/geotechnical engineer
- Triad Engineering – survey and soil testing
- DGI-Menard – dynamic compaction contractor
- WVDOH – Engineering, Contract Admn., D2
- FHWA – HQ, Resource Center, Division Office

What is Dynamic Compaction?

- Improve density of poor bearing soil
- Drop weight from crane – set height, set number of times over a set grid
- Consolidates material over a required depth of influence
- Publication SA-95-037 – Dynamic Compaction

Dynamic Compaction Plan

Required Equipment, Drop Weight Grid Spacing, and Number of Drops

Crane Size: 100 ton minimum

Weight: 16 ton (3 ft square or diameter)

Height of drop: 75 feet minimum

Dynamic Compaction Plan

- Primary drop points to be located on a 15 ft center-to-center spacing, resulting in a total of 36 drop points (6 by 6 grid)
- 5 consecutive drops at each grid point

Site Locations

1. Premium Energy no. 3 mining site (new fill by contractor's method)
2. Twisted Gun Golf Course Road (existing fill by WVDOH Specifications)
3. Twin Star Mining Site (existing fill by end dump method)


LIEBHERR

Results

- Average crater depth after 5 drops

1. Premium Energy No. 3 – 2.25 feet
2. Twisted Gun Golf Course Road – 2.86 feet
3. Twin Star Mining – 3.62 feet

The coal company method and WVDOH Specification Method resulted in a fill that may contain an estimated 8-10% voids in the upper 30 feet of the fill

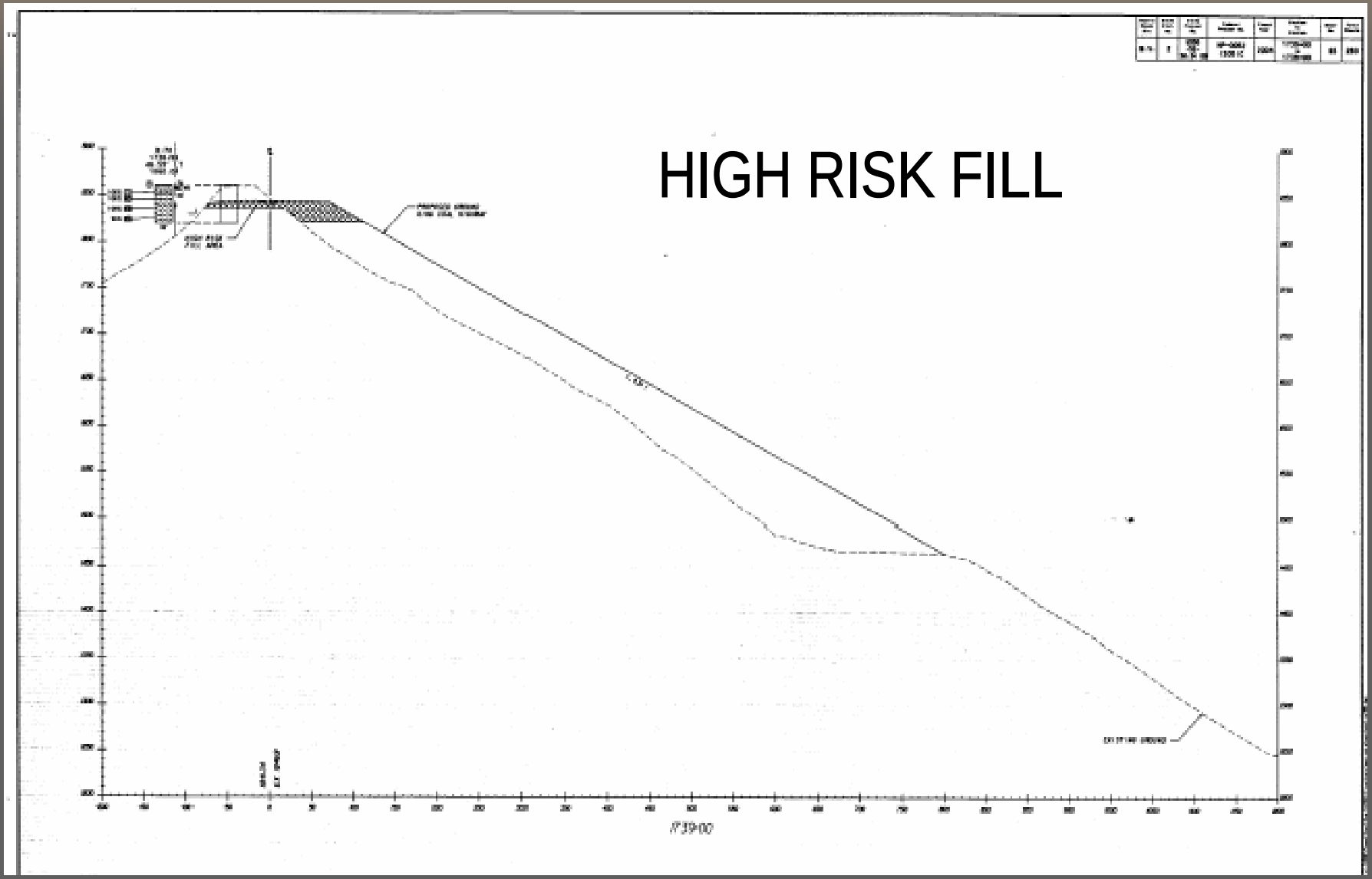
Conclusions

- The contractor's proposed method will result in an embankment with a similar relative density and behavior under dynamic loading as that constructed by the WVDOH Standard Specification method
- The Contractor's proposed method appears to be suitable for the proposed embankment construction for non-critical fill areas (as defined by the WVDOH)

Specification Development

- Use coal company method for typical valley fills (3-5 foot lifts of rock with benches (terraced) every 50 feet)
- Use WVDOH Standard Specification for “High Risk” fills

Specifications



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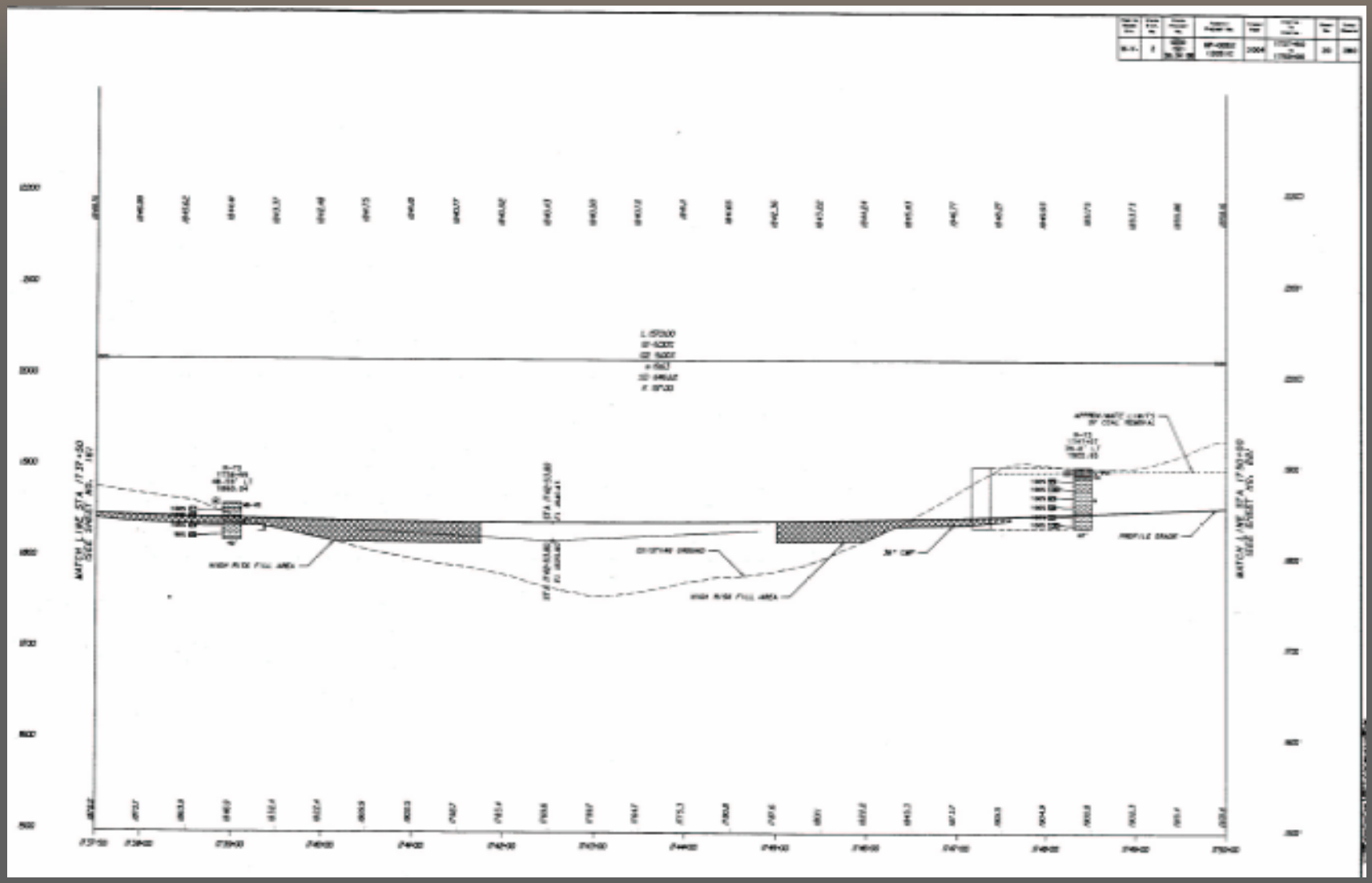
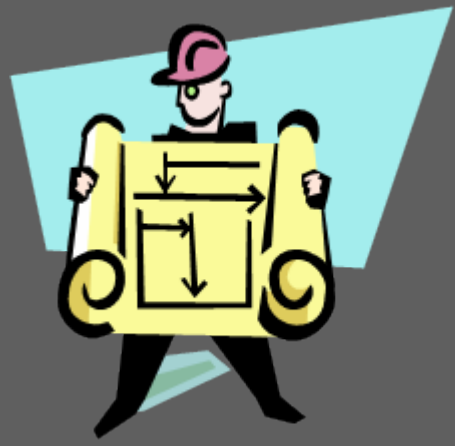


CURRENT STATUS

- PS&E ….September 2004
- Have a Simplified Schedule (Not CPM)
- No utilities encountered to date
- R/W donated
- Amount Authorized $37.5 million
- Amount Spent $16.2 million
- Approximately 10 million cyds material
- Anticipated Completion – Summer 2010



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