Federal Railroad Administration
Office of Safety
Headquarters Assigned
Accident Investigation Report
HQ-2009-42

Burlington Northern Santa Fe Company (BNSF)
Bill, WY
September 20, 2009

Note that 49 U.S.C. §20903 provides that no part of an accident or incident report made by the Secretary of Transportation/Federal Railroad Administration under 49 U.S.C. §20902 may be used in a civil action for damages resulting from a matter mentioned in the report.

DEPARTMENT OF TRANSPORTATION
FEDERAL RAILROAD ADMINISTRATION

FRA FACTUAL RAILROAD ACCIDENT REPORT

FRA File # HQ-2009-42

1.Name of Railroad Operating Train #1: BNSF Rwy Co. [BNSF]	1a. Alphabetic Code: BNSF	1b. Railroad Accident/Incident No.: PR0909101
2.Name of Railroad Operating Train #2: N/A	2a. Alphabetic Code: N/A	2b. Railroad Accident/Incident No.: N/A
3.Name of Railroad Operating Train #3: N/A	3a. Alphabetic Code: N/A	3b. Railroad Accident/Incident No.: N/A
4.Name of Railroad Responsible for Track Maintenance: BNSF Rwy Co. [BNSF]	4a. Alphabetic Code: BNSF	4b. Railroad Accident/Incident No.: PR0909101
5. U.S. DOT_AAR Grade Crossing Identification Number:	6. Date of Accident/Incident: Month 09 | Day 20 | Year 2009	7. Time of Accident/Incident: 01:40: ☑ AM ☐ PM

8. Type of Accident/Indicent *(single entry in code box)*: 1. Derailment; 2. Head on collision; 3. Rear end collision; 4. Side collision; 5. Raking collision; 6. Broken Train collision; 7. Hwy-rail crossing; 8. RR grade crossing; 9. Obstruction; 10. Explosion-detonation; 11. Fire/violent rupture; 12. Other impacts; 13. Other *(describe in narrative)* — Code: 01

9. Cars Carrying HAZMAT	10. HAZMAT Cars Damaged/Derailed	11. Cars Releasing HAZMAT	12. People Evacuated	13. Division
0	N/A	N/A	0	Powder River

14. Nearest City/Town	15. Milepost *(to nearest tenth)*	16. State Abbr	16. State Code	17. County
Bill	91.0	N/A	WY	CONVERSE

18. Temperature (F) *(specify if minus)*	19. Visibility *(single entry)* 1. Dawn 2. Day 3.Dusk 4.Dark — Code	20. Weather (single entry) 1. Clear 2. Cloudy 3. Rain 4. Fog 5.Sleet 6.Snow — Code	21. Type of Track 1. Main 2. Yard 3. Siding 4. Industry — Code
55 F	4	1	1

22. Track Name/Number	23. FRA Track Class (1-9, X) — Code	24. Annual Track Density *(gross tons in millions)*	25. Time Table Direction 1. North 2. South 3. East 4. West — Code
Main Track One	4	148	3

OPERATING TRAIN #1

26. Type of Equipment Consist *(single entry)* 1. Freight train 2. Passenger train 3. Commuter train 4. Work train 5. Single car 6. Cut of cars 7. Yard/switching 8. Light loco(s). 9. Maint./inspect.car — A. Spec. MoW Equip. Code	27. Was Equipment Attended? 1. Yes 2. No — Code	28. Train Number/Symbol
1	1	CNAMCCM016

29. Speed *(recorded speed, if available)* R - Recorded E - Estimated — Code	30. Trailing Tons *(gross tonnage, excluding power units)*
37 MPH R	18437

31. Method(s) of Operation *(enter code(s) that apply)*: a. ATCS; b. Auto train control; c. Auto train stop; d. Cab; e. Traffic; f. Interlocking; g. Automatic block; h. Current of traffic; i. Time table/train orders; j.Track warrant control; k. Direct traffic control; l.Yard limits; m.Special instructions; n. Other than main track; o. Positive train control; p. Other *(Specify in narrative)*

Code(s): e | N/A | N/A | N/A | N/A

31a. Remotely Controlled Locomotive? 0 = Not a remotely controlled; 1 = Remote control portable; 2 = Remote control tower; 3 = Remote control transmitter - more than one remote control transmitter: 0

32. Principal Car/Unit	a. Initial and Number	b. Position in Train	c. Loaded *(yes/no)*
(1) First involved *(derailed, struck, etc)*	DEEX11384	37	yes
(2) Causing *(if mechanical cause reported)*	DEEX11384	37	yes

33. If railroad employee(s) tested for drug/alcohol use, enter the number that were positive in the appropriate box.

Alcohol	Drugs
0	0

34. Was this consist transporting passengers? (Y/N): N

35. Locomotive Units	a. Head End	Mid Train b. Manual	Mid Train c. Remote	Rear End d. Manual	Rear End c. Remote
(1) Total in Train	2	0	0	0	1
(2) Total Derailed	0	0	0	0	0

36. Cars	Loaded a. Freight	Loaded b. Pass.	Empty c. Freight	Empty d. Pass.	e. Caboose
(1) Total in Equipment Consist	130	0	0	0	0
(2) Total Derailed	33	0	0	0	0

37. Equipment Damage This Consist	38. Track, Signal, Way, & Structure Damage	39. Primary Cause Code	40. Contributing Cause Code
$1,712,719.00	$808,000.00	E51C	N/A

Number of Crew Members

41. Engineer/ Operators	42. Firemen	43. Conductors	44. Brakemen
1	0	1	0

Length of Time on Duty

45. Engineer/Operator	46. Conductor
Hrs 6 Mi 9	Hrs 6 Mi 9

Casualties to:	47. Railroad Employees	48. Train Passengers	49. Other
Fatal	0	0	0
Nonfatal	0	0	0

50. EOT Device? 1. Yes 2. No — 1

51. Was EOT Device Properly Armed? 1. Yes 2. No — 1

52. Caboose Occupied by Crew? 1. Yes 2. No — N/A

OPERATING TRAIN #2

53. Type of Equipment Consist *(single entry)* 1. Freight train 2. Passenger train 3. Commuter train 4. Work train 5. Single car 6. Cut of cars 7. Yard/switching 8. Light loco(s). 9. Maint./inspect.car — A. Spec. MoW Equip. Code	54. Was Equipment Attended? 1. Yes 2. No — Code	55. Train Number/Symbol
N/A	N/A	N/A

56. Speed *(recorded speed, if available)* R - Recorded E - Estimated — Code
0 MPH N/A

58. Method(s) of Operation *(enter code(s) that apply)*: a. ATCS; b. Auto train control; g. Automatic block; h. Current of traffic; m.Special instructions; n. Other than main track

58a. Remotely Controlled Locomotive? 0 = Not a remotely controlled; 1 = Remote control portable

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57. Trailing Tons *(gross tonnage, excluding power units)* N/A

c. Auto train stop; d. Cab; e. Traffic; f. Interlocking; i. Time table/train orders; j.Track warrant control; k. Direct traffic control; l.Yard limits; o. Positive train control; p. Other *(Specify in narrative)* Code(s): N/A N/A N/A N/A N/A

2 = Remote control tower
3 = Remote control transmitter - more than one remote control transmitter: N/A

59. Principal Car/Unit	a. Initial and Number	b. Position in Train	c. Loaded *(yes/no)*
(1) First involved *(derailed, struck, etc)*	0	0	N/A
(2) Causing *(if mechanical cause reported)*	0	0	N/A

60. If railroad employee(s) tested for drug/alcohol use, enter the number that were positive in the appropriate box.

Alcohol	Drugs
N/A	N/A

61. Was this consist transporting passengers? (Y/N) N/A

62. Locomotive Units	a. Head End	Mid Train b. Manual	Mid Train c. Remote	Rear End d. Manual	Rear End c. Remote
(1) Total in Train	0	0	0	0	0
(2) Total Derailed	0	0	0	0	0

63. Cars	Loaded a. Freight	Loaded b. Pass.	Empty c. Freight	Empty d. Pass.	e. Caboose
(1) Total in Equipment Consist	0	0	0	0	0
(2) Total Derailed	0	0	0	0	0

64. Equipment Damage This Consist: $0.00

65. Track, Signal, Way, & Structure Damage: $0.00

66. Primary Cause Code: N/A

67. Contributing Cause Code: N/A

Number of Crew Members

68. Engineer/ Operators	69. Firemen	70. Conductors	71. Brakemen
0	0	0	0

Length of Time on Duty

72. Engineer/Operator: Hrs 0 Mi 0

73. Conductor: Hrs 0 Mi 0

Casualties to:	74. Railroad Employees	75. Train Passengers	76. Other
Fatal	0	0	0
Nonfatal	0	0	0

77. EOT Device? 1. Yes 2. No N/A

78. Was EOT Device Properly Armed? 1. Yes 2. No N/A

79. Caboose Occupied by Crew? 1. Yes 2. No N/A

OPERATING TRAIN #3

80. Type of Equipment Consist *(single entry)*: 1. Freight train; 2. Passenger train; 3. Commuter train; 4. Work train; 5. Single car; 6. Cut of cars; 7. Yard/switching; 8. Light loco(s); 9. Maint./inspect.car; A. Spec. MoW Equip. Code: N/A

81. Was Equipment Attended? 1. Yes 2. No Code: N/A

82. Train Number/Symbol: N/A

83. Speed *(recorded speed, if available)* Code: R - Recorded; E - Estimated N/A MPH N/A

84. Trailing Tons *(gross tonnage, excluding power units)* N/A

85. Method(s) of Operation *(enter code(s) that apply)*: a. ATCS; b. Auto train control; c. Auto train stop; d. Cab; e. Traffic; f. Interlocking; g. Automatic block; h. Current of traffic; i. Time table/train orders; j.Track warrant control; k. Direct traffic control; l.Yard limits; m.Special instructions; n. Other than main track; o. Positive train control; p. Other *(Specify in narrative)* Code(s): N/A N/A N/A N/A N/A

85a. Remotely Controlled Locomotive?
0 = Not a remotely controlled
1 = Remote control portable
2 = Remote control tower
3 = Remote control transmitter - more than one remote control transmitter: N/A

86. Principal Car/Unit	a. Initial and Number	b. Position in Train	c. Loaded *(yes/no)*
(1) First involved *(derailed, struck, etc)*	N/A	N/A	N/A
(2) Causing *(if mechanical cause reported)*	N/A	N/A	N/A

87. If railroad employee(s) tested for drug/alcohol use, enter the number that were positive in the appropriate box.

Alcohol	Drugs
N/A	N/A

88. Was this consist transporting passengers? (Y/N) N/A

89. Locomotive Units	a. Head End	Mid Train b. Manual	Mid Train c. Remote	Rear End d. Manual	Rear End c. Remote
(1) Total in Train	N/A	N/A	N/A	N/A	N/A
(2) Total Derailed	N/A	N/A	N/A	N/A	N/A

90. Cars	Loaded a. Freight	Loaded b. Pass.	Empty c. Freight	Empty d. Pass.	e. Caboose
(1) Total in Equipment Consist	N/A	N/A	N/A	N/A	N/A
(2) Total Derailed	N/A	N/A	N/A	N/A	N/A

91. Equipment Damage This Consist: N/A

92. Track, Signal, Way, & Structure Damage: N/A

93. Primary Cause Code: N/A

94. Contributing Cause Code: N/A

Number of Crew Members

95. Engineer/ Operators	96. Firemen	97. Conductors	98. Brakemen
N/A	N/A	N/A	N/A

Length of Time on Duty

99. Engineer/Operator: Hrs N/A Mi N/A

100. Conductor: Hrs N/A Mi N/A

Casualties to:	101. Railroad Employees	102. Train	103. Other
Fatal	N/A	N/A	N/A
Nonfatal	N/A	N/A	N/A

104. EOT 1. Yes 2. No N/A

105. Was EOT Device Properly 1. Yes 2. No N/A

106. Caboose Occupied by Crew? 1. Yes 2. No N/A

Highway User Involved

107. A. Auto; B. Truck; C. Truck-Trailer.; D. Pick-Up Truck; E. Van; F. Bus; G. School Bus; H. Motorcycle; J. Other Motor Vehicle; K. Pedestrian; M. Other *(spec. in narrative)* Code: N/A

108. Vehicle Speed *(est. MPH at impact)* N/A

109. *geographical)* 1.North 2.South 3.East 4.West Code: N/A

Rail Equipment Involved

111. Equipment 1.Train *(units pulling)*; 2.Train *(units pushing)*; 3.Train *(standing)*; 4.Car(s) *(moving)*; 5.Car(s) *(standing)*; 6.Light Loco(s) *(moving)*; 7.Light(s) *(standing)*; 8.Other *(specify in narrative)* Code: N/A

112. Position of Car Unit in N/A

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110. Position 1.Stalled on Crossing 2.Stopped on Crossing 3.Moving Over Crossing 4. Trapped	Code N/A	113. Circumstance 1. Rail Equipment Struck Highway User 2. Rail Equipment Struck by Highway User	Code N/A
114a. Was the highway user and/or rail equipment involved in the impact transporting hazardous materials? 1. Highway User 2. Rail Equipment 3. Both 4. Neither	Code N/A	114b. Was there a hazardous materials release 1. Highway User 2. Rail Equipment 3. Both 4. Neither	Code N/A
114c. State here the name and quantity of the hazardous materials released, if any. N/A			

115. Type Crossing Warning 1.Gates 2.Cantilever FLS 3.Standard FLS 4.Wig Wags 5.Hwy. traffic signals 6.Audible 7.Crossbucks 8.Stop signs 9.Watchman 10.Flagged by crew 11.Other *(spec. in narr.)* 12.None	116. Signaled Crossing *(See instructions for codes)*	Code	117. Whistle Ban 1. Yes 2. No 3. Unknown	Code
Code(s) N/A N/A N/A N/A N/A N/A N/A	N/A	N/A		N/A

118. Location of Warning 1. Both Sides 2. Side of Vehicle Approach 3. Opposite Side of Vehicle Approach	Code N/A	119. Crossing Warning with Highway Signals 1. Yes 2. No 3. Unknown	Code N/A	120. Crossing Illuminated by Street Lights or Special Lights 1. Yes 2. No 3. Unknown	Code N/A

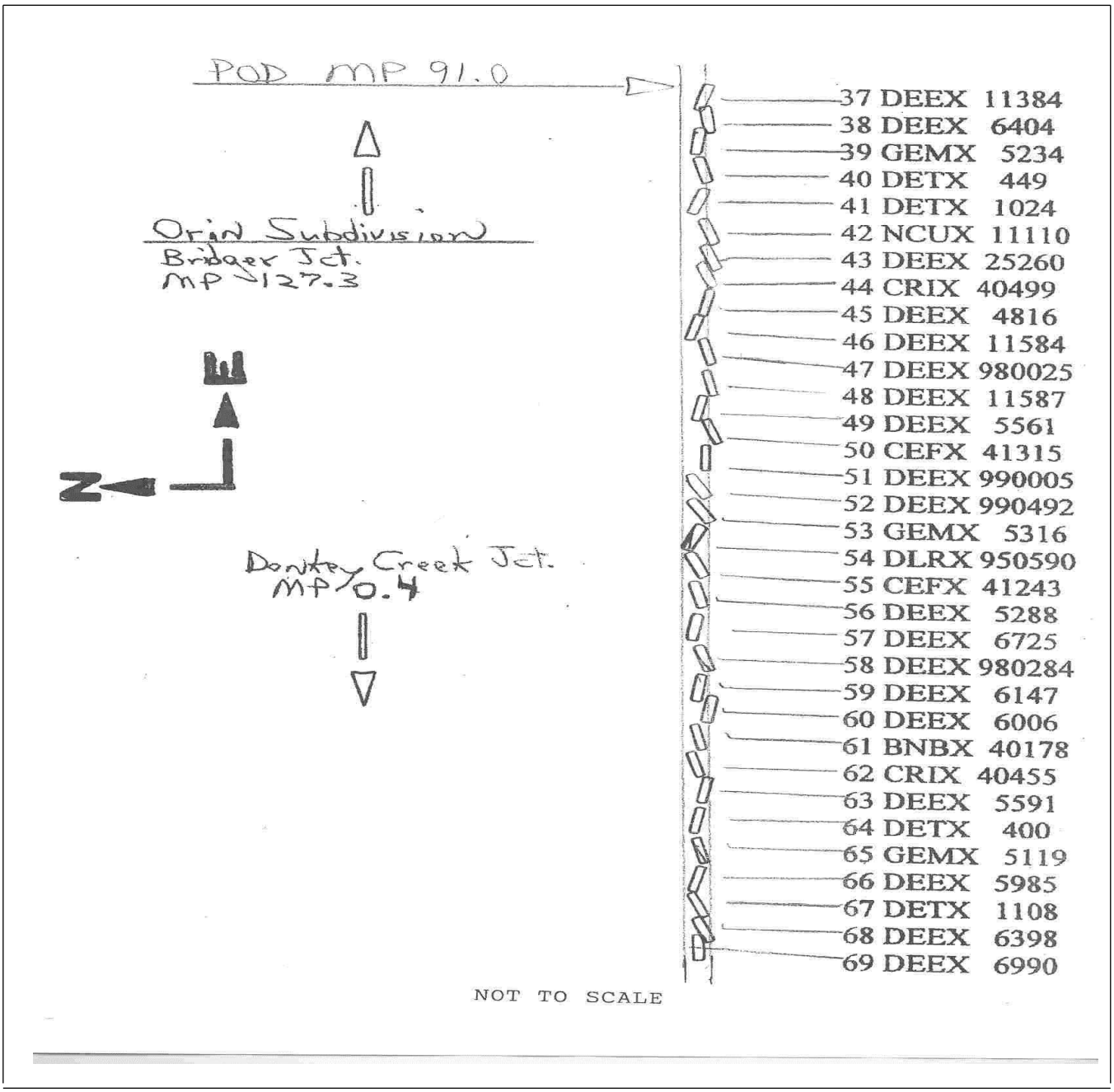
121. Age N/A	122. Driver's Gender 1. Male 2. Female	Code N/A	123. Driver Drove Behind or in Front of and Struck or was Struck by Second Train 1. Yes 2. No 3. Unknown	Code N/A	124. Driver 1. Drove around or thru the Gate 2. Stopped and then Proceeded 3. Did not Stop 4. Stopped on Crossing 5. Other *(specify in narrative)*	Code N/A

125. Driver Passed Highway Vehicle 1. Yes 2. No 3. Unknown	Code N/A	126. View of Track Obscured by *(primary obstruction)* 1. Permanent Structure 2. Standing Railroad Equipment 3. Passing Train 4. Topography 5. Vegetation 6. Highway Vehicle 7. Other *(specify in narrative)* 8. Not obstructed	Code N/A

Casualties to:	Killed	Injured	127. Driver 1. Killed 2.Injured 3. Uninjured	Code N/A	128. Was Driver in the Vehicle? 1. Yes 2. No	Code N/A
129. Highway-Rail Crossing Users	N/A	N/A	130. Highway Vehicle Property Damage *(est. dollar damage)*	N/A	131. Total Number of Highway-Rail Crossing Users *(include driver)*	N/A

132. Locomotive Auxiliary Lights? 1. Yes 2. No	Code N/A	133. Locomotive Auxiliary Lights Operational? 1. Yes 2. No	Code N/A
134. Locomotive Headlight Illuminated? 1. Yes 2. No	Code N/A	135. Locomotive Audible Warning Sounded? 1. Yes 2. No	Code N/A

136. DRAW A SKETCH OF ACCIDENT AREA INCLUDING ALL TRACKS, SIGNALS, SWITCHES, STRUCTURES, OBJECTS, ETC., INVOLVED.



137. SYNOPSIS OF THE ACCIDENT

An eastbound BNSF Railway Company (BNSF) freight train derailed on September 20, 2009, at 1:40 a.m. MDT. The accident occurred in Bill, WY, which is listed as a station page in the BNSF timetable located approximately 90 miles east of the city of Gillette, WY, at milepost 91.0, on Main Track #1, in triple main track territory, on the BNSF's Powder River Division, Orin Subdivision.

The train consisted of three locomotives (2 on the leading end and 1 remote on the rear), and 130 loaded coal cars. The 37th through the 69th cars behind the locomotives derailed as it was traveling east on a descending grade of tangent track. The locomotives and cars traveled approximately 500 feet after the emergency brake application. The derailment resulted in a blockage of all three main tracks. All three tracks were cleared and placed back in service on September 21, 2009, at 6:20 p.m.

The railroad estimated that there was signal damages of $58,000, track damages of $750,000, and equipment damages of $1,712,719. Total railroad damages were estimated at $2,520,719. There were no injuries to the train crew, and there was no hazardous materials involved.

At the time of the derailment it was dark with clear skies and a temperature of 55 degrees F.

The probable cause of the accident was a broken axle (number three axle broke between the wheel seats), on loaded coal car DEEX11384, the 37th car in the consist.

138. NARRATIVE

Circumstances Prior to the Accident

The crew of BNSF train symbol C NAMCCM016A consisted of a locomotive engineer, and a conductor. They first went on duty at 7:30 p.m. MDT, September 19, 2009, at North Antelope Yard in Gillette, Wyoming. This was the operating crew's home terminal, where both crew members had received more than the required statutory off-duty period, prior to reporting for duty. Their assigned freight train consisted of 3 locomotives and 130 loaded coal cars, had 18,437 trailing tons, and was 7,122 feet in length. It was a freight train scheduled to travel from Gillette, Wyoming, to Clay City, Minnesota then on to Chicago, Illinois, a total distance of approximately 1,150 miles.

Train CNAMCCM016A had received a FRA Class 1 air brake test (initial terminal) at Lincoln, Nebraska, on September 18, 2009, at 10:20 a.m. The train departed Lincoln with 3 locomotives and 123 empty coal cars. On September 19, 2009, after having received a FRA Class 1 air brake test, seven additional cars were added to the train at Alliance, Nebraska. On September 19, 2009, the train was loaded with coal, at the North Antelope Mine and departed Gillette, Wyoming, at approximately 8:40 p.m. The train did not require a pre-departure brake test at Gillette because the train was never off air for more than four hours and no cars were added to the consist, at Gillette.

As the train approached the derailment area, the locomotive engineer was seated at the controls on the right (south) side of the leading locomotive. The conductor was seated on the left (north) side of the cab of the leading locomotive.

Approaching the derailment site on Main Track No. 1 from the west and traversing eastward the track is tangent between milepost 90.72 and milepost 91.45 followed by a 1-degree right hand curve that extends approximately to milepost 91.6. There is a back track/set out track off of Main Track No. 1 between milepost 90.70 and milepost 91.15. The track at this location is descending from west to east at a 1 percent grade between milepost 90.03 and milepost 91.35. Beginning at milepost 91.35 the track transitions to a 1 percent ascending grade for a distance of approximately 1.5 miles. In addition, there are private road crossings

located at mileposts 90.60 and 91.29.

Interviews conducted by the Federal Railroad Administration (FRA) revealed the trip was uneventful prior to the derailment.

The Accident

The derailment occurred at or near the east back track switch off of Main Track No. 1. As the train was traveled eastward, a sudden undesired application of the emegrgency brakes occured which resulted in the consist coming to a stop. The 37st through the 69th cars behind the locomotives derailed as it was traveling east on descending track. The leading locomotives and cars traveled approximately 500 feet after the emergency brake application.

After coming to a stop, the conductor notified the train dispatcher. The conductor walked back to inspect the train and determined that the 37st through the 69th cars behind the locomotives had derailed and all three main tracks were fouled. A total of 33 cars derailed.

Further investigation of the derailment determined that the initial POD was at milepost 91.0, on a descending grade track. Train C NAMCCM016A was traveling timetable and geographical direction east on single main track at a recorded speed of 37 mph while approaching the POD. The speed was recorded by the event recorder of the controlling locomotive. The maximum authorized speed for this segment of track on the Orin Subdivision is 50 mph, as designated by the current BNSF Timetable No. 9, dated July 23, 2008.

The two person train crew did not report any injuries.

Post Accident Investigation

On September 20, 2009, the Federal Railroad Administration (FRA) began conducting an investigation of this accident/incident. FRA's Region 8 assigned a Motive Power and Equipment Inspector as Inspector-in-Charge and he was assisted by a FRA Track Inspector. A complete and thorough investigation was conducted by the Federal Railroad Administration. The following analysis and conclusion as well as any possible contributing factors and the probable causes represent the findings of FRA's investigation.

Analysis and Conclusions

Analysis- Toxicological Testing: This accident met the criteria for FRA Post Accident Toxicology Testing, as required under Title 49 CFR, Part 219, Subpart C. The crew was blood and urine tested at an Occupational Health Services Collection Facility.

Conclusion: Test results were negative for the engineer and conductor.

Analysis- Locomotive Event Recorder: An inspection and analysis of the leading locomotive's data recorder was conducted.

Conclusion: The data printout for the event recorder indicated that the train was being operated at a speed of 37 mph at the point-of-derailment. The event recorder also indicated no unusual events related to train handling.

Analysis- Wayside Detectors: Data downloads were performed from four wayside (dragging equipment) detectors which train CNAMCCM016A had operated over prior to arriving at milepost 91.0, the point-of-derailment. They were located on Main Track #1 at mileposts 75.4, 78.4, 83.3, and 88.1.

Conclusion: Data printouts from those detectors show that no defects were noted when train C NAMCCM016A traversed over them.

Analysis- Laboratory Analysis of Broken Axle: The broken axle off of loaded coal car DEEX 11384 was sent to BNSF's facility at Topeka, Kansas, for laboratory analysis.

Conclusion: FRA is awaiting results of testing.

Analysis- On-Site Observation of Broken Axle: An FRA on-site observation was conducted by FRA's Inspector-in-Charge (IIC) who is also a qualified Motive Power& Equipment Inspector.

Conclusion: The IIC determined that the broken axle appeared to have a 75 percent old break, and that the axle had been manufactured in 2002, by Griffin Wheel Company, of Keokuk, Iowa.

Analysis-Employee Fatigue: FRA obtained fatigue related information, including a 10-day work/rest history, for all of the employees involved in this incident.

Conclusion: FRA concluded that the employees may have been working at a slight diminished level of safety (effectiveness) due to mental and/or physical attributes associated with fatigue; however FRA further concluded that the possible fatigue of the crew members was not a contributing factor to this accident/incident.

Contributing Factors

FRA was unable to determine any possible contributing factors to this accident/incident. There were no exceptions taken to train handling, track structures or any of the equipment; other then the culprit axle on loaded coal car, DEEX11384, and this was determined to be virtually undetectable until the catastrophe failure of the axle occurred.

Probable Cause

The FRA's investigation determined that the probable cause of this accident was a broken axle; (number three axle broke between the wheel seats), on loaded coal car DEEX11384, the 37th car in the consist.