Federal Railroad Administration
Office of Safety
Headquarters Assigned
Accident Investigation Report
HQ-2007-22

Burlington Northern Santa Fe (BNSF)
Ash, Nebraska
April 24, 2007

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-2007-22

1.Name of Railroad Operating Train #1: BNSF Rwy Co. [BNSF]	1a. Alphabetic Code: BNSF	1b. Railroad Accident/Incident No.: PR0407110
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.: PR0407110
5. U.S. DOT_AAR Grade Crossing Identification Number:	6. Date of Accident/Incident: Month 04 Day 24 Year 2007	7. Time of Accident/Incident: 05:40: ☑ AM ☐ PM

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

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

14. Nearest City/Town	15. Milepost (to nearest tenth)	16. State Abbr	Code	17. County
Ashby	314.5	N/A	NE	GRANT

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
43 F		1		3		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.	Code
Main Track No. 1		4	144.11		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. Yes	1	CNAMPAM110

29. Speed (recorded speed, if available) R - Recorded E - Estimated			Code
46	MPH	R	

30. Trailing Tons (gross tonnage, excluding power units): 17892

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
Code: 0

32. Principal Car/Unit	a. Initial and Number	b. Position in Train	c. Loaded (yes/no)
(1) First involved (derailed, struck, etc)	JHMX 95288	36	yes
(2) Causing (if mechanical cause reported)	0	0	N/A

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	126	0	0	0	0
(2) Total Derailed	43	0	0	0	0

37. Equipment Damage: This Consist 2577628
38. Track, Signal, Way, & Structure Damage: 381569
39. Primary Cause Code: M507
40. Contributing Cause Code: 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: Hrs 2 Mi 15
46. Conductor: Hrs 2 Mi 15

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	1. Yes	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): 0

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

65. Track, Signal, Way, & Structure Damage: 0

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: 0

84. Trailing Tons (gross tonnage, excluding power units): 0

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)	0	0	N/A
(2) Causing (if mechanical cause reported)	0	0	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	0	0	0	0	0
(2) Total Derailed	0	0	0	0	0

90. 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

91. Equipment Damage This Consist: 0

92. Track, Signal, Way, & Structure Damage: 0

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
0	0	0	0

Length of Time on Duty

99. Engineer/Operator: Hrs 0 Mi 0

100. Conductor: Hrs 0 Mi 0

Casualties to:	101. Railroad Employees	102. Train	103. Other
Fatal	0	0	0
Nonfatal	0	0	0

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	Code	113. Circumstance	Code
1.Stalled on Crossing 2.Stopped on Crossing 3.Moving Over Crossing 4. Trapped	N/A	1. Rail Equipment Struck Highway User 2. Rail Equipment Struck by Highway User	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	N/A	114b. Was there a hazardous materials release 1. Highway User 2. Rail Equipment 3. Both 4. Neither	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
Code(s)	N/A	N/A	N/A	N/A	N/A	N/A	N/A					

116. Signaled Crossing (See instructions for codes)	Code	117. Whistle 1. Yes 2. No 3. Unknown	Code
	N/A		N/A

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

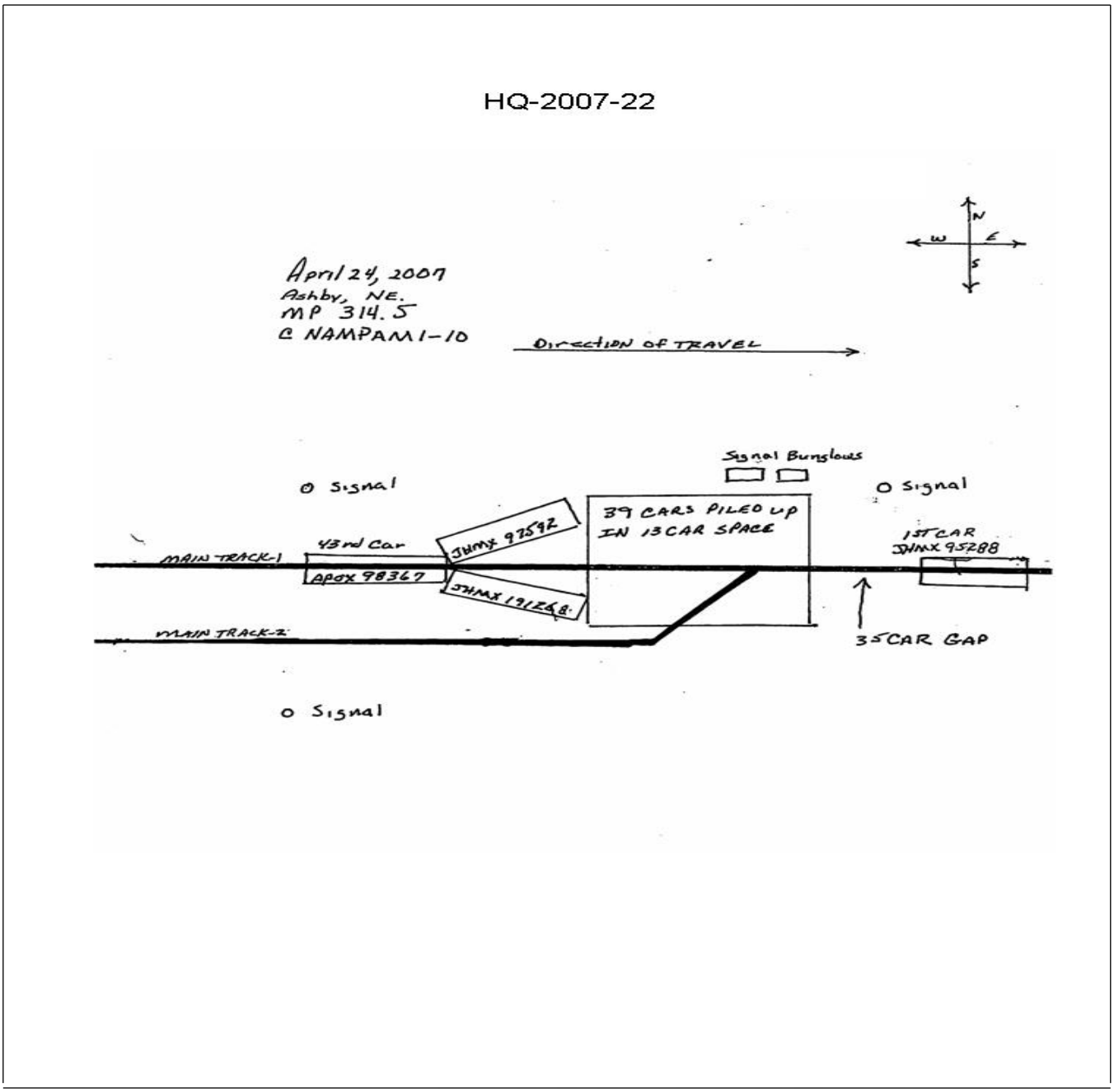
121. Age	122. Driver's Gender 1. Male 2. Female	Code	123. Driver Drove Behind or in Front of and Struck or was Struck by Second Train 1. Yes 2. No 3. Unknown	Code	124. Driver 1. Drove around or thru the Gate 2. Stopped and then Proceeded 3. Did not Stop 4. Stopped on Crossing 5. Other (specify in narrative)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

125. Driver Passed Highway Vehicle 1. Yes 2. No 3. Unknown	Code	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		N/A

Casualties to:	Killed	Injured	127. Driver 1. Killed 2.Injured 3. Uninjured	Code	128. Was Driver in the Vehicle? 1. Yes 2. No	Code
				N/A		N/A
129. Highway-Rail Crossing Users	0	0	130. Highway Vehicle Property Damage (est. dollar damage)	0	131. Total Number of Highway-Rail Crossing Users (include driver)	0

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

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



137. SYNOPSIS OF THE ACCIDENT

Eastbound coal Train Symbol C NAMPAM1 10 derailed 43 cars on April 24, 2007, at 5:40 a.m., m.d.t. The accident occurred approximately 1 mile east of the town of Ashby, Nebraska, at milepost (MP) 314.5 on the BNSF Railway Company's (BNSF) Sand Hills Subdivision, Powder River Division. The Sand Hills Subdivision is utilized by BNSF to operate 6 manifest and 54 coal trains per day.

There were no injuries or release of hazardous material from the train as a result of the accident. A wayside propane tank was dislodged from its concrete pad and the fuel line used to fuel the switch heater was severed. A minimal amount of propane was released into the atmosphere until the valve was closed at the propane tank. No evacuation occurred as a result of the release other than BNSF employees were not allowed on the scene until the tank had been secured.

As there were no injuries, response was limited to BNSF personnel from various operating and engineering departments and outside contractors consisting of Hulcher Emergency Services, and R. J. Corman Derailment Services.

The weather at the time of the accident was raining and 43 degrees Fahrenheit with a northeast wind gusting at 24 to 29 mph, visibility was minimal.

Reportable estimated damages for rolling equipment are $2,577,628; track estimated damages $351,569; and signal equipment estimated damages $30,000. For a total of $2,959,197 in estimated damages.

After investigating the evidence available, the primary cause assigned to this derailment is M507 - "Investigation complete, cause could not be determined." Analysis of recovered evidence did not reveal a cause. There was a considerable amount of track and mechanical components that was never recovered.

138. NARRATIVE

Circumstances Prior to the Accident

The crew of Train Symbol C NAMPNM1 10 included a locomotive engineer and a conductor. They went on duty at 3:25 a.m., m.d.t.; on April 24, 2007, at Alliance, Nebraska. This is the home terminal for both the conductor and engineer. The required off-duty time for the conductor and engineer was 8 hours. The conductor was off duty for 40 hours, 15 minutes and the engineer was off duty 47 hours, 5 minutes, prior to reporting for duty on April 24. All crew members received more than the statutory off-duty period, prior to reporting for duty.

The last required testing of Train Symbol C NAMPAM1 10 was a Class 1 air brake test at the railroad location of Donkey Creek in Wyoming, on April 22, 2007.

Their train consisted of 2 head-end locomotives, 1 distributed power locomotive, 126 loaded coal cars, and no empty cars. It was 6,833 feet in length and weighed 17,892 tons. The train departed Alliance and was scheduled to travel to Ravenna, Nebraska. There were no required inspections or air brake tests performed on Train Symbol C NAMPAM1 10 at Alliance. Train Symbol C NAMPAM1 10 departed Alliance at approximately 4:28 a.m., m.d.t.

As the eastbound train approached the accident area, the engineer was operating the train from the engineer's seat at the locomotive control stand of the lead locomotive which was located on the south side of the locomotive. The conductor was positioned in the conductor's seat on the north side of the locomotive.

The railroad timetable direction was east; the geographical direction was east. Timetable directions are used throughout this report

The terrain on which the accident occurred was at the east end of double main track, on Main Track No. 1 which is tangent main line track. The roadbed is slightly elevated due to the roadbed being built on a .49 percent descending grade. The rail is 136-lb continuous-welded rail (CWR). The ties for Main Track No. 1 are concrete and the rail is secured with Mckay clips. The switch ties are wood and the rail is secured with lag screws and pandoral clips.

The Accident

The train was traveling at 46 mph recorded speed approaching the derailment site. The maximum authorized speed for coal trains in this area is 50 mph as designated in current BNSF Timetable No. 8. Speeds were recorded by the event recorder of the second locomotive of the consist, Locomotive No. BNSF 6028. The engineer and conductor indicated that at or near the point of derailment , they felt a soft spot in the track and the engineer reports seeing sparks coming from the bottom of their second locomotive. The engineer was in the process of notifying the dispatcher of the soft track condition when the dragging equipment detector located at MP 314.5 sounded an alarm to the train crew of dragging equipment and the train went into an emergency train brake application.

After the train stopped the conductor began walking the train and when she arrived between the 11th and 12th cars, Car Nos. JHMX 97519 and JHMX 99319, she found the air hoses uncoupled. She recoupled the air hoses and tried to recover the train's air brakes, but was unsuccessful. She continued walking her train and when she reached the 34th car, Car No. JHMX 95288 ,the first car derailed; she observed a gap of approximately 35 car lengths between it and the second derailed car, Car No. JHMX 95394. It was then determined that the 34th car from the trailing locomotive through 76th car had derailed. The conductor immediately notified the engineer, the engineer immediately notified Sand Hills Subdivision train dispatcher of the derailment, and appropriate BNSF personnel were dispatched to the derailment site.

Analysis and Conclusion

Analysis

Toxicological testing was conducted as the federal post-accident criteria was met. Test results were negative for the two crew members.

The Fatigue Avoidance Scheduling Tool (FAST) analysis report indicates fatigue was probable for both crew members involved in this derailment but it is not being considered as a contributing factor in this derailment

During the investigation, data was examined by the BNSF and FRA from the previous hot box detector located approximately 24 miles west of the accident site and the dragging equipment detector located approximately 5.5 miles west of the accident site. There was no information from this data that indicated any mechanical conditions that could have caused the derailment.

The event recorder data from the second locomotive, Locomotive No. BNSF 6028, did not indicate any signs of poor train handling. The data indicated that the train was traveling within the required speeds. It also showed the locomotive was in dynamic braking, throttle position 4; a locomotive operating in this manner would indicate the cars of the train were bunched.)

The division engineer stated that the track was last inspected by hi-rail and geometry car survey on April 23, 2007, with no defective conditions taken in this area. The last ultrasonic rail detection test through this area was on March 30, 2007, with no defective conditions taken in this area.

The FRA investigation revealed that 125 feet of rail, switch components, four freight car wheel sets, two freight car truck side frames, and two freight car bolsters were never found during the investigation; therefore, could not be analyzed.

Conclusion.

Despite spending three days at the site, the BNSF investigation team, consisting of Powder River Division managers and members from the BNSF Technical Research and Development team, and the FRA investigators, could not determine a cause to the Ashby derailment. The derailment area was last tested with the geometry car on April 23, 2007, approximately 16 hours prior to the derailment, with no defective conditions taken. FRA's inspection of all equipment, track components and the download of the event recorder did not reveal a probable cause. There was no evidence discovered that would indicate a mechanical, track, or human factor probable cause of this accident. There is also 125 feet of rail, switch components, four freight car wheel sets, two freight car truck side frames, and two freight car truck bolsters that have not been found. Evidence discovered at the site did not reveal anything that would have contributed to the cause of this accident.

Probable Cause and Contributing Factors

Analysis of recovered evidence did not reveal a cause. There was a considerable amount of track and mechanical components that was never recovered. Therefore, the FRA found the probable cause of the investigation as complete and the cause could not be determined (M507).