Factual Report

FIRE SHELTER DEPLOYMENT

YAKAMA AGENCY
Toppenish, Washington

July 13, 2002

FIRE NUMBER #041 Pumphouse.

U. S. Department of the Interior
Bureau of Indian Affairs
Yakama Agency
Toppenish, Washington

SIGNATURE PAGE:

TABLE OF CONTENTS

#841 Pumphouse Fire Deployment
July 13,2002


CATERPILLAR

EXECUTIVE SUMMARY:

On Saturday July 13, 2002 at about 1930 hours, a dozer boss and a dozer operator assigned to the Yakama Indian Reservation "Pumphouse Fire", deployed fire shelters when they became concerned for their health and safety at that location.

The fire was reported to the Yakama Fire Control Dispatch on Saturday July 13, 2002, at 1413 hours. It was reported that smoke was detected by the Satus Peak Lookout in the general locality of Island and Pumphouse Road. This location is within the Mutual Protection Area for Yakima County Fire Protection District No. 5 and the B.I.A Yakama Agency. Initial attack procedures were started with two engines, a water tender and a dozer along with support personnel.

Several pieces of District 5 equipment arrived at the incident first as residential structures were within the area and the District deployed their equipment for structure protection. The point of origin of the fire was at the base of Toppenish Ridge with winds driving the fire easterly paralleling the base of the ridge. Initial attack forces consisting of two engines, a water tender, a dozer and a Type III Incident Commander was dispatched from the Yakama Agency to the point of origin to assist with suppression. The fire was being pushed downslope on the south side of Toppenish Ridge by west-northwest winds towards the Oak Springs road. The wind switched to a southwesterly direction causing the fire to make a upslope run to the northeast toward the deployment site.

At approximately 1630 hours, the Incident Commander from the Yakama Agency directed their resources from the north side of Toppenish Ridge south to Oak Springs Road. The tactics employed were to improve, secure and hold an indirect line using an existing dozer line from a previous fire. After improving approximately 1000 feet of line, the engines could not provide holding operations due to the steep terrain. At this point the dozer operator was working approximately 300-500 feet ahead of the engines. The dozer continued up the east side. The dozer operator did not respond to radio traffic directing him to stop. The dozer boss caught up with the dozer and rode with the operator to the top of Toppenish Ridge where they cleared a deployment site with the dozer and deployed their shelters. A District No. 5 Chief Officer arrived shortly after the deployment and it was determined that there were no injuries.

The deployment incident was not reported to the Yakama Agency Fire Management Officer until July 15, 2002, during a morning safety briefing and was delayed in reporting to the Bureau of Indian Affairs National Office until August 1, 2002.

An investigation team was assembled to investigate the deployment, and have completed a review of the records and conducted interviews to determine the causal factors contributing to the deployment. DOI guidelines in the 485 Manual were followed in

conducting the investigation.

INCIDENT OVERVIEW:

During the summer months of 2002, the Yakama Agency was experiencing a period of Extreme Fire Danger, with high temperatures and exceptionally low humidity. Severe drought conditions throughout most of the west, above normal temperatures and below normal precipitation contributed to these conditions.

The fire was reported to the Yakama Fire Control Dispatch on Saturday July 13, 2002, at 1413 hours. It was reported that smoke was detected by the Satus Peak Lookout in the general locality of Island and Pumphouse Road, a wildland urban interface area next to residential structures. This location is within the Mutual Protection Area for Yakima County Fire Protection District No. 5 and the B.I.A Yakama Agency. Initial attack procedures were started with two engines, a water tender and a dozer along with support personnel.

At approximately 1519 hours on the day of the fire, an on site weather reading was taken by the Initial Attack Incident Commander near the origin of the fire. The temperature was 103 degrees, humidity 12% and winds 12-15 mph out of the West-Northwest. Fuels within the majority of the Pumphouse Fire area consisted of cheat grass with scattered sagebrush and grease wood. The topography of the fire was in mountainous terrain located on the top and to the south of Toppenish Ridge, within the Yakama Agency. The Ridge runs north and south and is Southwest of Toppenish, Washington. The fire was in the initial attack phase on the afternoon of July 13, 2002 and was exhibiting high rates of spread cross slope with the wind.

Several pieces of District 5 equipment arrived at the incident first as residential structures were within the area and the District deployed their equipment for structure protection. Initial attack forces consisting of two engines, a water tender, a dozer and a Type III Incident Commander (Max Corpuz Jr.) was dispatched from the Yakama Agency to the point of origin to assist with suppression. The point of origin of the fire was at the base of Toppenish Ridge with winds driving the fire easterly paralleling the base of the ridge. The IC reported that the wind stayed out of the West-Northwest helping to push the fire over Toppenish Ridge and down slope towards the Oak Springs road and into the Dry Creek Drainage.

At approximately 1630 hours, the Incident Commander from the Yakama Agency directed their resources from the north side of Toppenish Ridge south to the Oak Springs Road. The tactics employed were to improve, secure and hold an indirect line using an existing dozer line from a previous fire. The dozer was being supported by the White Swan Engine and crew, Engine #924 from the Job Corps and Agency Engine #920. Ralph Sampson, from the Agency was assigned as task force leader to take charge of the

southeast portion of the fire along with the engines and one dozer. The assigned task was to stop the east progression of the fire.

After improving approximately 1000 feet of line, the engines could not provide holding along the dozer line operations due to the steep terrain. Ralph Sampson stopped the burning operation when the engines could not keep up and secured the area already burned out. Sampson then assigned burnout operations to the engine foreman, Stan Sixkiller.

The wind changed to the Southwest and started pushing the fire in a Northeasterly direction toward the top of the ridge. It was decided at that time by the dozer boss (Everett Isaac) and the engine foreman (Stan Sixkiller) to abandoned this strategy and the engines were sent back down the slope to the staging area at Oak Springs Road. At this point the dozer operator was working approximately 300-500 feet ahead of the engines. Attempts were made to contact the dozer operator (Marcus Slome), but, he did not answer and continued up the east side. The fire behavior began to increase in intensity.

The dozer operator did not respond to radio traffic directing him to stop. The dozer boss was approximately 75 yards down slope of the dozer and had to run several hundred yards up slope to catch the dozer. After many repeated efforts of trying to contact the operator by radio and tell him to stop, he finally stopped to adjust the blade and the dozer boss caught up with the dozer. By this time they thought it was too late to retreat back down the trail and continued up the old cat-line to the top of the ridge. The dozer boss rode with the operator to the top of Toppenish Ridge where they cleared a deployment site with the dozer. They could not observe the fire behavior from their location and the smoke and wind were increasing. They successfully deployed their shelters without injuries at approximately 1930 hours. The fire did not reach the deployment location.

A District No. 5 Chief Officer (Brian Vogel) arrived about 2000 hours from the west across the ridge road shortly after the deployment and offered assistance, but, as there were no injured and the equipment was ok, they continued to work on the fire line. Brian Vogel stated that the fire never threatened the deployment safety zone, but did eventually cross the ridge road although not at the deployment site.

The deployment incident was not reported to the Yakama Agency Fire Management Officer until July 15, 2002, during a morning safety briefing and was delayed in reporting to the Bureau of Indian Affairs National Office until August 1, 2002. Max Corpuz Jr, the Agency Fire Management Officer reported the deployment to his supervisor, Edwin Lewis right after the meeting of July 15, 2002.. Edwin Lewis requested that the Agency Safety Officer, Roger Sanchey investigate the deployment and be sure that it was a reportable incident. There was almost a two week period, from July 15, 2002 to August 1, 2002 before the Agency Superintendent Clarence Holford was informed of the deployment. The National Office of the Bureau of Indian Affairs was immediately

notified and an Investigation Team was assigned to look into the deployment. Final containment of the fire was July 16, 2002 at 1000 hours.

CHRONOLOGICAL HISTORY OF FIRE EVENTS

PUMPHOUSE FIRE #041
YAKAMA AGENCY

1413 hours---Smoke was reported to Yakama Fire Control Dispatch by Status Peak Lookout Approximate location was at Island and Pumphouse Road. This was in an area with structures and falls under Cooperative agreement with the Yakima County District No. 5.

1417 hours---Initial Attack resources were dispatched from the Agency to assist District No. 5 responding resources with fire suppression. Resources consisted of 2-Engines, 1-Watertender and a Type III Commander.

1435 hours---The first Agency resources arrived on scene with additional equipment in route. District No. 5 resources had deployed their equipment for structure protection in this residential area.

1445 hours---Received confirmation at dispatch that aerial assistance was not available. This information was relayed to the Incident Commander.

1500 hours---Incident Commander requesting that Ralph Sampson make an assessment of the conditions at the South Harrah location which will be used for staging area at the fire point of origin.

1512 hours---All agency units are to go to TAC 1, Channel 3 for fire traffic.

1519 hours---Incident Commander, Max Corpuz on scene and made decision to move staging area to South Harrah location. Made weather observation, Temperature 103 degrees, 12% Humidity and Winds southwesterly 12-15 mph. Fuels were cheatgrass, and heavy sage/greasewood. Flame lengths 10-15 feet.

1535 hours---Incident Commander reporting that the wind is really pushing the fire and it is about 1-mile beyond the South Harrah staging site and moving east-southeast . Two District engines and two BIA engines attempt to stop fire along the south end and keep it from going up the hill. Westerly winds push fire upslope toward the top of Toppenish Ridge.

1605 hours---Incident Commander requests that Ted Stevens go to the south side of Toppenish Ridge to Oak Springs Road to see if fire had gone over the ridge.

1621 hours---Incident Commander sending Everett Isaac and Marcus Slome, the dozer boss and operator to get dozer and report to the south side of the ridge at Oak Springs Road and start working that side.

1631 hours---Incident Commander informed the District No. 5 Chief Officer that he would be moving all agency resources to the south side of the ridge to try and stop the fire from getting into Dry Creek drainage. This is the south-eastern edge of the fire. Staging would be at the Oak Springs Road and Highway 97.

1653 hours---Status Peak Lookout report a wind change Southwesterly 15-18 mph.

1718 hours---Dozer Boss, Everett Isaac and Operator, Marcus Slome reporting that they are enroute to the Oak Springs Road staging area.

1738 hours---Dozer Boss and Operator arrived at the staging area on Oak Springs road.

1752 hours---Update from the Incident Commander that the fire is now about 3,000 acres. The wind change is causing the fire to cross Oak Springs Road into the Dry Creek drainage and also move up the drainage to the Northeast.

1800 hours---(Approximately) Dozer Boss Everett Isaac, Operator Marcus Slome and three-Engines start improvement, burnout and hold operations from Oak Springs Road north to the top of Toppenish Ridge

The following is not recorded in the logs but, taken from the statements of those involved.

Between 1800 hours and 2000 hours,---Engines disengage from the planned burnout and hold operations with Dozer Boss Everett Isaac and operator Marcus Slome due to the steep terrain, increased fire intensity and the changing winds to a southwesterly direction. Engines and dozer were separated by about 300-500 yards at the time decision was made to disengage. Dozer operator did not answer radio request to stop and return back down to the safety zone and continued to walk up to top of ridge. Dozer Boss finally caught the dozer but was unable to return back down the trail to the safety zone as the fire had crossed the line cut by the dozer. Dozer continued up the trail to the top of the ridge. On top of the ridge, the operator cut a clearing with the dozer for deployment of their shelter.

1930 hours---Everett Isaac and Marcus Slome deployed their Fire Shelters.

2000 hours---District No. 5 Chief Officer, Brian Voge,l arrive at deployment site across the ridge road from the west. He found that the two were not injured and all parties to the deployment incident continued their fire assignments building handline.

2009 hours---Incident Commander turned the Fire over to Ted Stevens the Agency Assistant

Fire Management Officer.

Morning briefing of July 15, 2002, deployment was finally reported to the Incident Commander, and Agency Fire Management Officer Max Corpuz.

INVESTIGATION PROCESS:

The investigation of the "Pumphouse Fire" Deployment on the Yakama Agency in Toppenish, Washington was initiated by the Bureau of Indian Affairs through the National Fire and Aviation office in Boise, Idaho. The Deployment Incident Investigation Team, led by Roy Doore, received its Delegation of Authority on August 5, 2002, from the Bureau of Indian Affairs Northwest Regional Director in Portland, Oregon. The investigation team followed the guidance found in the Department of the Interior Manual 485 Chapter 7, for 'Serious Accident Investigations".

The team members were:

$ Roy Doore, Team Leader, BIA, Blackfeet Agency, Browning, MT.
$ William J. Huntington, Chief Investigator, BLM, Phoenix, AZ.
$ Michael J. Spencer, Safety Officer, U.S. Forest Service, Portland, OR.
$ Michael Asher, Operations Specialist , Chelan County Fire District 8, Entiat, WA.
$ Greg Peterson, Fire Behavior Analyst, BIA, Minnesota Agency, Bemidji, MN.
$ Cory Winnie, Regional Office Contact, BIA, Portland, OR.
$ Roger Sanchey, Team Liaison, Safety Officer, Yakama Agency, White Swan, WA.

The members of the investigation team were notified on Friday August 3, 2002 and convened at the Yakama Indian Reservation in Toppenish, Washington August 4, 2002 at 1830 for initial in-briefing by Cory Winnie, BIA, Regional Fire Management Officer from the Portland, OR. Regional Office. Monday morning August 5, 2002, at 0800 hours the team in-briefed with the Yakama Agency Superintendent Clarence Holford, and the Agency Forest Manager, Edwin Lewis. The team then proceeded to the deployment site for familiarization and to photograph the site. Some onsite interviews were conducted.

An Investigative Action Plan was developed to guide the team's activities, interviews were conducted, and reference documents were obtained and reviewed. . The team received assistance from the Yakama Agency employees and BIA personnel stationed locally. Interviews from those directly involved in the deployment and witnesses from the Yakama Nation Fire Management Control organization, Yakima County Fire Protection District No. 5 crew and Initial Attack Crew members out of the Yakama Nation Fire Management Control were obtained.

Those interviewed were:

$ Clarence Holford, Yakama Agency Superintendent.
$ Edwin Lewis, Yakama Agency Forest Manager.
$ Max Corpus Jr., Yakama Agency Fire Management Officer.
$ Ted Stevenson, Assistant Agency Fire Management Officer.
$ Marcus Slome, Agency Dozer Operator.
$ Everette Isaac, Agency Dozer Boss.
$ Ralph Sampson, Task Force Leader, Fuels Technician.
$ Brian Vogel, District No. 5 Assistant Chief Officer.
$ Arnie Peterson, Assistant Agency Forest Manager/IC.
$ John Mesplie, Timber Sales/IC.
$ Arnold Eyle, Pumper Operator/Engine Operator
$ Phillip Burdeau, Engine Operator/Cat-Operator.
$ Stan Sixkiller, Job Corp Engine Operator.
$ Roger Sanchey, Agency Safety Officer.

The Wildland Fire Fatality and Entrapment Initial Report, NFES, 0869, was not completed and received by the National office until August 1, 2002, (Appendix No.5)

Additional information was gathered on weather, fire behavior, flame spread, burning conditions, fuel combustion, rate of spread, Topography and resources availability (Appendix No. 3). The PPE clothing and shelters were not available for inspection and forwarding to MTDC for their review. Shelters and clothing were not subjected to any fire exposure, and fire did not reach this deployment site.

A 24-Hour and a 72- Hour report was sent to the BIA, Regional Director in Portland, Or, informing him of our investigative progress.

On August 8, 2002, the team updated and out-briefed with the Acting Agency Superintendent, Acey Oberly, Self Determination Specialist for the Agency, Edwin Lewis, Agency Forest Manager, Mike Morigeau, Assistant Agency Forest Manager, Roger Sanchey, Safety Officer and the entire Investigation Team.

The Close out with BIA Director of Fire and Aviation in Boise, ID, was completed.

A **Root Cause Analysis Technique** was used to identify findings that had an influence on this shelter deployment. The investigation team identified the causal factors directly related to the deployment and have stated those in our findings and recommendations.

FINDINGS AND RECOMMENDATIONS

FIRE BEHAVIOR

Findings:

1. Fuels - The area was enduring a lengthy drought with the potential fire intensity nearing historic levels for this time of year. There were very high to extreme fire indices being reported. Fuels in the area consisted of cheat grass with scattered sagebrush and greasewood.

2. Weather - High temperatures, low humidity with changing winds with a thunderstorm forecasted for that evening. Heavy smoke was present along east side of fire and at the deployment site.

3. Topography - Mountainous terrain with the elevation changing from 800 feet to 2000 feet at the top of the ridge. Deployment site was in a saddle on the ridge.

Recommendations:

1. Ensure that projected fire behavior is covered in the pre-incident briefing with all personnel involved in the fire management activities.

2. During reduced visibility lookouts should be posted to keep constant surveillance of fire line activities. Keep in constant communications with your lookouts.

3. A saddle in mountainous terrain is not a good deployment site. Upslope winds push through these locations.

ENVIRONMENTAL FACTORS:

Findings:

1. Smoke - Due to heavy smoke the dozer boss and the operator could not see the fire line from their deployment site.

2. Temperature - Extreme fire conditions were present due to long periods of high temperatures and low humidity.

3. Winds - Changing wind directions to the southwest 10-15 mph contributed to the deployment when original fire strategy was deviated from and changing wind directions

pushed fire line towards dozer operations.

Recommendations:

1. Re-evaluate strategy with changing weather conditions and establish sound tactics for suppression.

2. When developing strategy, utilize the risk management process in the Incident Response Pocket Guide (IRPG) NFES #1077.

3. Be sure lookouts and communications with all resources are well established at all times and especially during extreme fire behavior.

INCIDENT MANAGEMENT:

Findings:

1. Strategy - The suppression tactics employed of improve, burn-out and hold an indirect line on the east side of the fire were sound Under the cooperative agreement between the Yakima County District No. 5 and the Yakama Agency, operations were not integrated nor unified under one command structure.

2. Tactics - As the dozer constructed line, it became separated from the line burn-out operations and Engine support. It was unable to carry a safety zone (in the black) along with it.

3. Briefings - Resources received different briefings and therefore not all of the components of LCES were understood or implemented in a comprehensive, complete manner by all resources.

4. After action briefing of the fire was not conducted to determine what went well and what didn't. At this time the Shelter Deployment event should have been discovered.

5. Instructions Understood/Followed - The dozer operator did not acknowledge and/or follow instructions to stop walking the dozer up the ridge during this changing period of fire behavior.

Recommendations:

1. Utilize briefing checklist contained in the NWCG Incident Response Pocket Guide, NFES #1077 before and during fire suppression activities.

2. The Agency should revise the Cooperative Agreement with Yakima Fire District No. 5 and the Annual Operations Plan based upon the development of new standards and procedures for operations. Those standards/procedures should reflect the total integration of suppression activities under a single, integrated ICS-compliant structure. Organization, operations. and communications need to be totally integrated. Joint advanced training in ICS should be considered.

3. Do not get too far ahead of your burnout operations when constructing indirect or parallel fire line.

4. Use a re-certification process to evaluate the dozer boss and operator qualifications.

5. Immediately conduct an after-event debriefing to bring out changes and improvements needed.

CONTROL MECHANISMS:

Findings:

1. Span of Control - It was unsure throughout the entire fire suppression operation who was in charge of the fire. Yakima Fire District No. 5 and the Yakama Agency had different responsibilities, although it was not controlled under a unified command structure. The IC was constantly changing and command was not communicated to all resources. The fire was a Type III complexity incident (extended attack) staffed and managed at the Type IV level (initial attack).

2. Communications - Heavy initial attack traffic on the radio made it extremely difficult to communicate when necessary on the fire. Lack of a dedicated command-repeat fire frequency adversely affects operations.

Recommendations:

1. Use initial-extended attack operational guidelines found in PMS 410-1(Fireline Handbook). With assistance from cooperators, develop and maintain a pool of IMT Type III resources for team dispatch. Use complexity analysis to determine appropriate level of overhead structure needed for an incident. Ref: BLM's Standards for Fire and Aviation Operations Handbook.

2. Request a Communications Technical Assistance Team (CTAT) to evaluate current and ongoing communication problems and develop a plan of action to address frequency management and frequency needs.

PERSONNEL PROFILES:

Findings:

1. Training/qualifications/physical fitness - Neither the dozer boss nor dozer operator have successfully performed the tasks associated with their respective positions.

2. Attitudes - The Yakama Agency and the Yakima County District No. 5 response teams developed a joint strategy for suppression of the fire but then went their separate ways during implementation of that strategy.

3. Reporting Process - There was a breakdown on the reporting process for shelter deployments.

Recommendations:

1. Ensure personnel are qualified and capable of successfully performing in the position to which they are assigned as outlined in PMS 310-1 (Wildland and Prescribed Fire Qualification System Guide)

2. The wildland urban interface problem in this area is going to continue to get worse. The team strongly feels that a more cooperative relationship be established between the Agency and the County Fire department

3. Review shelter deployment reporting processes and inform all resources of their responsibilities for reporting this event.

EQUIPMENT:

Findings:

1. Availability - Resources were adequate for incident.

2. Clothing and equipment - The PPE all worked as designed. There was however a three week separation between the shelter deployment and the team investigation. Since the PPE was not exposed to any flame, it was not sent to MTDC for evaluation. Clothing was worn during the rest of the fire incident.

Recommendations:

1. Ensure all PPE is used during suppression operations and retain if exposed to fire during deployment.

APPENDICES

APPENDIX NO. 1

MAP OF THE FIRE SCENE

APPENDIX NO. 2.

SKETCH OF DEPLOYMENT AREA

APPENDIX NO. 3

Pumphouse Fire Behavior Analysis for Sunday July 14, 2002 Yakima Agency

Fuels

Fuels in the fire area consisted of cheat grass with scattered sagebrush and greasewood. NFFL Fuel Model 2 represents this fuel model within the majority of the Pumphouse Fire area.

Fuel moistures where estimated from the closest Remote Automatic Weather Station (RAWS), Mill Creek. The Mill Creek RAWS site is located at 3900 feet elevation in the Yakima Indian Reservation approximately 15 miles west of the deployment site. The fine fuel moisture levels ranged from 5 to 8 % during the late afternoon into the early evening hours and 3 to 4 % at the time of ignition. The primary carrier of the fire was in the cured Cheat Grass fuels with the sagebrush adding to the intensities. The live woody fuel moisture values from the Mill Creek RAWS site were in 87% range. The fire danger indices for the Mill Creek RAWS were within and approaching the 90th percentile above average for this time of the season, Energy Release Component (ERC) was 15 which is at the 90th percentile and the Burning Index (BI) was 29, above the 90th .

Weather

The Pendleton, Oregon National Weather Service (NWS) Office issued a morning forecast on Saturday July 13, 2002 for partly cloudy and hot weather conditions with a chance of late afternoon thunderstorms, which including zone 675, the area of the Pumphouse Fire. A Haines index of 4 was forecast.

At 1315 hours the National Weather Service issued an updated forecast with no change for zone 675. Temperatures 97 – 100 on the ridges with relative humidity's 18 – 25 % and winds northwest 5 – 10 mph with guest to 17. At 1530 hours the NWS afternoon forecast issued a Red Flag Warning for dry lighting that evening, with cooler temps in the mid 70's and RH's in the high 30's to low 40's winds to continue West-Northwest at 6 – 10 mph, with a Haines index of 5.

Initial attack personnel reported winds at 12-15 mph out of the West-Northwest during the initial size-up at 1500 hours. The Mill Creek RAWS site recorded 20-foot winds at 9 mph out of the West-Southwest. Personnel in the dry creek area noticed thunderstorm development 50 miles to the south of the fire at the time of deployment. At 2156 it was reported that the fire area was receiving several lighting strikes from thunderstorms over the area.

An on site weather reading was taken by the Initial Attack Incident Commander at 1519 hours near the origin of the fire. The temperature was 103 degrees, humidity 12% and winds 12 – 15 mph out of the West-Northwest. The IC reported that the wind stayed out of the West-Northwest helping to push the fire over Toppenish Ridge and down slope into the Dry Creek Drainage. At this time the winds switched directions several times causing the fire to make an upslope run to the Northeast towards the

deployment site. At the same time the winds where pushing the fire to the Southeast across the Dry Creek Drainage. A spot weather forecast was requested for this incident at 2000 hours and received by the NWS at 2048. The forecast called for continued partly cloudy with a slight chance of thunderstorms.

The Mill Creek RAWS located in the Yakima Indian Reservation recorded the following weather conditions for July 13, 2002.

Time	Temperature F	Relative Humidity	Average Wind Speed MPH	Direction	Maximum Guest
1530	94	20	9	248	17
1730	88	33	6	224	15
1830	82	34	10	247	19
1930	77	42	5	217	19
2030	74	56	8	234	15
2130	70	62	8	237	18
2230	68	63	7	225	16
2330	68	61	5	222	12

Topography

The topography of the Pumphouse Fire was in mountainous terrain located on Toppenish Ridge, which runs north and south, southwest of Toppenish, Washington. Elevation relief from the valley bottom near the Pumphouse Road to the top of the Toppenish Ridge was from 800 feet to 2000 feet. Slopes at the deployment site were moderate in the 25-30% range, with a narrow drainage to the west of the ridgeline leading to the top of the Toppenish Ridge. The deployment site was located along the ridge road near the top of Toppenish Ridge in a saddle, elevation 1880 feet. The primary aspects in the vicinity were south to southwest. The exposed southwest aspect, chutes, and saddle help channel the heavy smoke towards the deployment site.

Predicted Fire Behavior

Fire behavior predictions were not made for the Pumphouse Fire on July 13, 2002. The fire cause is still under investigation. The fire was in the initial attack phase on the afternoon of on July 13, 2002, but was exhibiting high rates of spread cross slope with the wind. Using the Mill Creek RAWS site, weather forecast, information from the initial attack personnel, and on-site visits, fire behavior predictions were calculated to determine rate of spread (ROS) and fire intensities for the Pumphouse Fire.

Behave calculations were made using environmental inputs and data listed below:

Fuel Model	2	NFFL Fuel Model 2 was used to model the cheat grass and scattered sagebrush.
1 hour fuels	5-8 %	1 hour fuel moisture was calculated using on site weather readings and the Mill Creek RAWS temperature and relative humidity.
10 hour fuel	5%	Value from Mill Creek RAWS.
100 hour fuel	5%	Value from Mill Creek RAWS.
1000 hour fuel	11%	Value from Mill Creek RAWS
Live Herbaceous FM	69%	Value from Mill Creek RAWS
Live Woody FM	89%	Value from Mill Creek RAWS
Mid-flame wind	2-8	Recorded winds (mph) from Mill Creek RAWS site at 1930 hours average of 5 mph and peak guest at 19 mph, southwest direction.
Slope	25 %	Slope average 25 % on the southwest aspect in the proximity of the deployment site.

The calculated rate of spread prior to and during the deployment ranged from 14 chains/hour to 98 ch/hr at peak wind speeds. Flame lengths (FL) during this time period was calculated to be between 4 feet to 10 feet. The flame lengths and ROS were outside of handcrew control forces, but within mechanical control limits except at peak wind guest.

Observed Fire Behavior

The Pumphouse Fire was reported on Saturday July 13, 2002 at 1413 hours. The fire started within the Yakima County Fire Protection District No. 5 area and within the zone of mutual concern. The fire grew rapidly as a wind driven surface fire in the light grass fuels and crossed over into the Yakima fire protection area. By 1752 the IC estimated the fire to be 3000 plus acres and had cross over the Toppenish ridge to the southeast being pushed by west to northwest winds. The fire was being pushed downslope on the south side of Toppenish Ridge by west-northwest winds towards the Oak Springs road when the wind switched to a southwesterly direction. Wind speeds at this time were estimated to be 15 to 18 mph that pushed the fire upslope towards the dozer line and the deployment site. Flame lengths were reported initially at the Oak Springs Road of 20 to 30 feet and reported to the dozer and dozer boss.

As the fire spread upslope to the northeast the smoke followed the drainage and moved towards the dozer operator and dozer boss near the saddle. The smoke obscure the view of these personnel and they could not see the actual fire approaching. The Fire District 5 division supervisor was on the Toppenish Ridge road near the deployment site and estimated the flame lengths of 2 to 3 feet with moderate spread rates as the fire approached the top of the ridge at approximately 2000 hours. He also reported that it

was approximately 30 minutes from when he picked up the two firefighters after the deployment and when the fire crossed the Toppenish Ridge.

APPENDIX No. 4

FIRE ORDERS: *(6- compromised and contributed)

***1. Fight fire aggressively, but provide for safety first.**

- $ Proper PPE was in use
- $ Fire was fought aggressively with good strategy and techniques in place.
- $ Safety zone and disengagement plan was compromised necessitating the deployment of shelters. LCES and safety planning during the later stages of the fire action was not clear and not communicated to all resources.
- $ The dozer boss and operator diverted from the original safety plan. Contributed to the deployment.

2. Initiate all actions based on current and predicted fire behavior.

- $ Fire behavior was anticipated, known and did not contribute to the deployment.

3. Recognize current weather condition and obtain forecast.

- $ Current weather forecast and spot forecast was available.

***4. Ensure instructions are given and understood**.

- $ From the I.C. on down, it is not clear that instructions and chain of command was conveyed to all resources and that the dozer boss and the operator understood the strategy for disengagement. Safety plans in the later stages of the fire were not understood or followed.
- $ Contributed to the deployment.

5. Obtain current information on fire status.

- $ Fire intelligence was readily available.

***6. Remain in communication with your crew members, supervisors, and adjoining forces.**

- $ Under the unified command agreement with Yakima County Fire Protection District No. 5, communications between District 5 and the Agency crews was

fragmented to non-existent. Each were on different frequencies and operating separately without coordination of suppression efforts. This contributed to the deployment

$ Contributed to the deployment.

7. *Determine safety zones and escape routes.

$ Safety zones were known to be in the black and communicated to all resources but dozer operator did not follow safety plan. .

$ Escape route was compromised when the dozer boss and operator continued up hill and got unburned fuel between itself and the fire.

$ Contributed to the deployment

8. Establish lookout in potentially hazardous situation.

$ Lookout was posted and this did not contribute to the deployment.

***9. Maintain control at all times.**

$ The I.C. did not have control over the fire suppression operations as other resources operating under the Unified Command were operating separately.

$ Control under the Unified Command was never established.

$ Dozer boss did not have control over the dozer operations and the operator.

$ Contributed to the deployment

***10. Stay alert, keep calm, think clearly, act decisively.**

$ Dozer boss did not act decisively at the time of the change in strategy.

$ Dozer operator was not thinking clearly when he continued to traverse the old cat line to the top of the ridge.

$ Contributed to the deployment

<u>18 SITUATIONS THAT SHOUT WATCHOUT:</u> *(4 - compromised and contributed)

1. Fire not scouted and sized up

$ This was not a contributing factor.

2. You are in country not seen in daylight.

$ This was not a contributing factor.

***3. Safety zones and escape routes were not identified.**

$ Escape was identified but plan was not communicated to the operator.
$ Contributed to the deployment.

4. You are unfamiliar with weather and local factors.

$ This was not a contributing factor.

5. You are not informed of tactics, strategy and hazards.

$ This was not a contributing factor.

6. Instructions and assignments were not clear.

$ This was not a contributing factor.

7. No communication link has been established with the crew members and their supervisor.

$ This was not a contributing factor.

***8. You are constructing line without a safe anchor point.**

$ The safe anchor point was compromised when the dozer continued up hill away

from the burning operations.

$ Contributed to the deployment

9. You are building fire line downhill with fire below.

$ This was not a contributing factor.

10. You are attempting a frontal assault on the fire.

$ This was not a contributing factor.

***11. There is unburned fuel between you and the fire.**

$ Deviation from original plan put unburned fuel between the dozer operations and the fire at their point of decision.

$ Contributed to the deployment

***12. You cannot see the main fire and are not in contact with someone that can.**

$ Dozer boss and operator continued up to the ridge where they lost sight of the main fire and contact with those who could.

13. You are on a hillside where rolling material can ignite fuel below you.

$ This was not a contributing factor.

14. The weather is becoming hotter and drier.

$ This was not a contributing factor.

15. The wind is increasing or changing direction.

$ Winds shifting from Northwest to Southwest pushing the fire back up the drainage to the Northeast.

$ This was not a contributing factor.

16. You are getting frequent spot fires across the line.

$ This was not a contributing factor.

17. The terrain and fuel make escape to safety zone difficult.

$ This was not a contributing factor.

18. You feel like taking a nap near the fire line.

$ This was not a contributing factor.

APPENDIX NO. 5

NFES 0869 REPORT

Wildland Fire Fatality and Entrapment
INITIAL REPORT

Complete this report for fire-related entrapment and/or fatalities. Timely reporting of wildland-related entrapments or fatalities is necessary for the rapid dissemination of accurate information to the fire management community. It will also allow fire safety and equipment specialists to quickly respond to these events as appropriate. This initial report does not replace agency reporting or investigative responsibilities, policies, or procedures. Immediately notify the National Interagency Coordination Center (NICC). Submit this written report within 24 hours—**even if some data are missing**—to the address given below.

NICC—National Interagency Fire Center
3833 South Development Ave.

Phone: 208-387-5400
Fax: 208-387-5414

NICC Intelligence Section
E-mail: nicc_intel@nifc.blm.gov

Submitted by: Max Corpuz, Jr. Position: Fire Management Officor

Agency: Bureau of Indian Affairs Location: Yakama Agency, Toppenish, WA

Phone: 509-865-6653 E-mail:

1. General Information

- Date of event July 13, 2002 Time 1930
- Number of personnel involved 2
- Number of: Injuries NONE Fatalities NONE
- Fire name, location, agency, etc. #041 Pumphouse Yakama Indian Reservation, B.I.A., Yakama Agency, Toppenish, WA

2. Fatalities

- Type of accident:
  - ☐ Aircraft
  - ☐ Natural (lightning, drowning, etc.)
  - ☐ Medical (heart, stroke, heat, etc.)
  - ☐ Struck by falling object
  - ☐ Vehicle
  - ☒ Smoke
  - ☐ Entrapment
  - ☐ Other
- Where fatality/entrapment occurred:
  - ☐ Fire site
  - ☐ Incident base
  - ☐ In transit
  - ☐ Other

Note: In the event of fatality(s), do not release name(s) until next of kin are notified.

- Employing agency Bureau of Indian Affairs
- Unit name Yakama Agency Fire Management
- Address P.O. Box 632, Toppenish, WA 98948
- For further information, contact Max Corpuz, Jr.
  Home unit address P.O. Box 632, Toppenish, WA 98948
  Phone 509-865-6653

(Continued)

3. Fire-Related Information

- Fuel model A
- Temperature 85 RH 25 Wind W-SW 8-10 mph
- Topography Gentle, rolling terrain with elevation from 1500-2000 feet Slope 40 %
- Fire size at the time of the incident/accident 2,000+ acres
- Incident management type at the time of the incident/accident: (circle one) 1 2 (3) 4 5
- Urban/wildland intermix? ☒ Yes ☐ No
- Cause of fire: ☐ Natural ☐ Incendiary ☐ Accidental XX Unknown

4. Entrapment Information

A situation where personnel are unexpectedly caught in a fire-behavior-related, life-threatening position where escape routes or safety zones are absent, inadequate, or have been compromised. An entrapment may or may not include deployment of a fire shelter. Note: Engine and dozer burnovers also constitute entrapments.

(NOTE: NOTIFICATION OF THIS INCIDENT WAS NOT MADE UNTIL SEVERAL DAYS AFTER)

- Brief description of the accident

Dozer operator and lead person were building fireline up hill. Lead person tried to communicate over two-way radio for dozer to stop. Dozer operator did not follow instructions and continued up the hill. Lead person had to run up hill to catch the dozer to stop. Fire had crossed the drainage and was approaching their location. A safety zone/area was constructed, however, the dozer operator prematurely insisted that they deploy shelters.

Entrapment Description

- Person trapped ☒ With fire shelter ☐ Without fire shelter
- Burns/smoke injuries incurred while in fire shelter ☐ Yes ☒ No
- Burns/smoke injuries incurred while escaping entrapment ☐ Yes ☒ No
- Burns/smoke injuries incurred while fighting fire ☐ Yes ☒ No
- Fire shelter performed satisfactorily ☒ Yes ☐ No
- Fire shelter was available, but not used ☐ Yes ☐ No

Personal Protective Equipment Used

Fire shelter	☒ Yes ☐ No	Gloves	☒ Yes ☐ No
Protective pants	☒ Yes ☐ No	Boots	☒ Yes ☐ No
Protective shirt	☒ Yes ☐ No	Goggles	☒ Yes ☐ No
Face/neck protection	☒ Yes ☐ No	Hardhat	☒ Yes ☐ No

APPENDIX NO. 6

Entrapment Investigation Element Matrix

	Contribution To Entrapment		
	Did Not Contribute	**Influenced**	**Significant Contribution**
FIRE BEHAVIOR			
Fuels	X		
Weather		X	
Topography	X		
Predicted v. observed	X		
ENVIRONMENTAL FACTORS			
Smoke		X	
Temperature	X		
Visibility		X	
Slope	X		
Other			
INCIDENT MANAGEMENT			
Incident objectives	X		
Strategy	X		
Tactics	X		
Safety briefings/major concerns		X	
Instructions Given/Understood/Followed			X
CONTROL MECHANISMS			
Span of control		X	
Communications			X
Ongoing evaluations	X		
10 Standard Fire Orders/18 Watchout Situations		X	
PERSONNEL PROFILES OF THOSE INVOLVED			
Training/qualifications/physical fitness			X
Length of operational period/fatigue	X		
Attitudes	X		
Leadership/Supervision			X
Experience levels			X
EQUIPMENT			
Availability	X		
Performance/nonperformance	X		
Clothing and equipment	X		
Used for intended purpose?	X		

APPENDIX NO. 7

DELEGATION OF AUTHORITY