## WILDFIRE HAZARD RISK ASSESSMENT Access Based Subdivision Survey



The Texas A&M University System

Prepared by

Karen Ridenour - GIS Specialist II Texas Forest Service Stephanie Shelton – Graduate Student Texas State University Rich Gray – State UWI Coordinator Texas Forest Service Don Hannemann – EOC Coordinator Texas Forest Service

### WILDFIRE HAZARD RISK ASSESSMENT Access Based Subdivision Survey

- 1. Abstract
- 2. Program Operating Instructions
- 3. Questionnaire Protocol
- 4. Sample Blank Questionnaire Paper Copy

© Texas Forest Service 2009 No reproduction allowed without consent



#### Abstract

The intent of this access based wildfire hazard risk assessment program is to identify communities at risk based on overall hazards to the homes in a particular subdivision. Aspects such as road access, fire department response capabilities, water, utilities, fuels, topography, and home construction are all incorporated to determine an overall hazard risk for a home within a subdivision. This data can then be statistically examined to determine areas of high risk within neighbors based on the assessment.

The results from the assessment can be used in a number of ways:

- 1. Planning tool for the development of mitigation practices for a subdivision
- 2. Planning tool for emergency management services
- 3. Determine an overall hazards for a particular geographic area
- 4. Data can be integrated into a GIS format for development of maps

For this project, assessments where conducted on subdivision throughout the state in order to test the database for accuracy and in various geographic locations. Statistical test were run to determine the minimum number of homes that need to be tested in a subdivision to produce an accurate result. In addition, tests on the database itself to verify the accuracy of the overall hazard values. The database can be used to assess all homes in a subdivision for a comprehensive evaluation or used to get a general risk for by testing a minimum of 30% of the homes in random transects.

### WILDFIRE HAZARD ASSESSMENT PROGRAM OPERATING INSTRUCTIONS

The Wildfire Hazard Assessment program is an Access based program. Microsoft Office Access is required in order to operate this program. Additional software such as Delorme Topo or ESRI ArcMap is required in order to view layers in a GIS format.

1). Download the Wildfire Hazard Assessment master file from the Texas Forest Service website (http://txforestservice.tamu.edu/main/article.aspx?id=1598&terms=risk+assessment) OR Texas Interagency Coordination Center website (http://ticc.tamu.edu/UWI.htm) to your Local Drive (C), NOTE: You can download the database to any location, however once you unzip the file you will need to have selected a permanent location to store the database and the data you will input.

Opening WildfireHazard.zip		
You have chosen to o	ben	
过 WildfireHazar	d.zip	
which is a: WinZip File		
from: http://tfsfrp.tamu.edu		
What should Firefox do with this file?		
O Open with	WinZip (default)	
⊙ Save File		
Do this automatically for files like this from now on.		
	OK Cancel	

2). Run WinZip, selecting the final location for the database



3). **DO NOT** Rename the downloaded master file "wildfirehazard.mdb" it <u>will corrupt the</u> <u>database.</u> **\*YOU must, right click on the database file, select properties and make sure** that the <u>READ-ONLY</u> is unchecked.



4). Navigate to where you saved the database and double click to start the program. You will get a security warning "Select" Open



6). You will enter the data for each home into the following form. **NOTE: this box is to select a previous home, there will be nothing there until you have started inputting data**.

T E X	Wildfire Haz	ard Questionnaire		
The Town Addition	ito Jystan			
			ID Lookup	
	Date of Survey 3/31	2009 Site ID: Number)	V	
	Subdivision:	~		
	Street Address:			
	Latitude (DD   MM   SS): N	(Decimal Degrees):	0.00000	
	Longitude(DD MM 55): W	(Decimal Degrees):	0.00000	
	Survey Completed:	te Off-Site	,	
	Main Boards			
	Fiair Road.			
	Secondary Road:		×	
	Road Width:	1	¥	
	Maximum Grade:		¥	
	Readable Street Name:		*	
	Visible Identification:		*	
	Driveway Access:		*	
	Fire Department Response Time:	,	×	
	Underselar.			

**NOTE**: When entering latitude and longitude data you can utilize the DD|MM|SS boxes and a conversion to Decimal Degrees will automatically occur. If you have Decimal Minute coordinates just use the DD and MM boxes and leave the SS box blank

7). A completed questionnaire will look like the example below. You will notice that the Site ID is automatic number so that no duplication of homes occurs. Also as you add subdivision names to the database it will allow you to select them without having to retype them once they have been entered.

TEXAS FORIST SERVICE To These Additionants results	ard Questionnaire	
Date of Survey     3/31       Subdivision:     [ake of the P       Street Address:     [123 Happy S]       Latitude (DD  MM S5):     N       Longitude(DD  MM S5):     W       Survey Completed:     [On-S]	/2009 Site ID: 1 ID Lookup ines treet 2 (Decimal Degrees): 30.03333 5 (Decimal Degrees): 37.08333 te Off-Site	
Main Road:	1 - Medium 😒	
Secondary Road:	2 - 1 way in and out 💌	
Road Width:	1 - Narrow 💌	
Maximum Grade:	4 - More than 12% 💌	
Readable Street Name:	Jnmarked - OR - not understandable 💌	
Visible Identification:	2 - Name - AND - Number m 💙	
Driveway Access:	0 - Name - AND - Number readable 1 - Name - OR - Number readable	
Fire Department Response Time:	2 - Name - AND - Number missing or not readable	

**NOTE:** Drop Down Boxes are attached to each attribute to allow you to see what your choices are while assessing the homes if doing them on a laptop in the field.

8). You will notice at the bottom of the questionnaire is the hazard total based on hidden multipliers for each input value. (These multipliers are used only within the database to determine the risk value). Once you have finished the questionnaire you can go to the next form by selecting:

Window type:	2 - Thermal pane
Balcony:	0 - No Balcony or deck
Eaves:	1 - Enclosed underneath -
This total is based on the calcula	ated multipliers for each input value
Hazard Totals: <45 = Low Hazard 45 - 83 = Medium Hazar 84 - 106 = High Hazard >106 = Extreme Hazard	rd Hazard Total 57
View Site II I II	Hazard Total 57 💵
"Next Record" or "A	Add Record".

Once you have entered all the data for a particular subdivision you will have the option of viewing individual homes or entire subdivisions and printing a report.

Printable reports for records or distribution to homeowners to evaluate areas to address to improve risk.

Site ID Date of Survey Subdivisio Street Addrese Data	1 5/16/2004	HazardTota: 96	Holly lake Ra	nch		
Latitude (00:MM:SS)	Latitude00 mapping 32	72822		Site ID	HarandTotal	Stand delance
Longitude00:MMSS	Lengitude/00-menging	22403	Extreme Hazard	ane ID	74634767 0444	Giren Anness
				5	115	2116 Holly Ridge
Distance to Closest Fil	alls 12			4	110	Holly Trail
Vegatation of Subdivis	ion 12					
Vegatation on Lot	12		High Hazard			
Distance to Closest St	ructure 9			13	106	168 Pine Brach Glen
Detensible Space	8			9	105	
Main Road	-			1	96	287 Misty Glan
Secondary Road	4					
Siding Material	4				36	1909 Holly Frail
Aspect	3			2	92	227 Misty Glen
Hydranits	3			10	91	4315 Pine Branch Glen
Robot Witteriel	3			6	88	Holly Trial
Drat Source	2					
Drivevey Access	2		Medium Hazard			
Maximum Grade	2			8	83	1884 Holly Trail
Roof Vegetation	2			3	74	161 Misty Glen
Chimney Vegatation	1					
Computible Materials						
Electricity to Resisten						
Electricity to Subdivisi	00 1					
Slope	1					
WindowType	1					

When you have completed the questionnaire for an entire subdivision you can access the main page of the program by selecting the close form button

View Subdivision	Hazard Total	57

On the main page you will see an option for **Export for Mapping** 

- You can then select to create a **Comma Delimited File** for use in such mapping software programs as Delorme Topo
- Or you can select to create a **dBase IV** or **Excel File** for use in ArcMap products
- Finally, you have the choice to export to Google which will create a KML file
- Regardless of the choice the file will be saved in the same location as where you have permanently stored the database.

🗉 Data Export		×
TEXAS FOREST SERVICE The Texas ABM University System	Wildfire Hazard	
	<ul> <li>Export to Google KML</li> <li>Export to Excel</li> <li>Export Comma Delimited File</li> <li>Export to dBase IV</li> <li>Main Menu</li> </ul>	

Data Export for Mapping Window



KML Export into Google Earth Example

### Wildfire Hazard Questionnaire Protocol

**Date of Survey:** The date for the actual survey in the field. Make note of the day the survey is completed if it is different from the field date.

Site ID: This is automated number that keeps from having duplicate assessments

**Subdivision Name:** *Name of the main subdivision. If there is no obvious name, identify the area with street names or with city parcels.* 

**Street Address:** *Identify the street address for each house location. Use mailbox numbers and street names or information gained from the city post office or 911 dispatchers.* 

**Latitude (degrees minutes and seconds):** Use a GPS unit with a coordinate system chosen for Lat./Long. and a datum of WGS84. For example: DMS 32° 02' 32" will entered as 32 02 32. The program will calculate decimal degrees for mapping purposes. Do not include the N, E, S, or W

**Longitude (degrees minutes and seconds):** Use a GPS unit with a coordinate system chosen for Lat./Long. and a datum of WGS84. You will notice a "0" before the degree's negative number in your GPS unit, omit the negative sign and 0 when entering your location For example: -097° 22' 49" will be entered as: 97 22 49 Do not include the N, E, S, or W. The program will calculate decimal degrees for mapping purposes as well as include a negative sign).

**Was survey completed ON or OFF site:** Considered **onsite** only if homeowners have granted permission for access to property. If the field surveyor(s) stayed in the street or in the vehicle without stepping/driving onto the property then it is considered **offsite**.

#### The previous information is for reference use only and is not required for data entry

\* Note: Rankings were made to take into account subjectivity. If in doubt on any rankings either rate each question at the highest feasible level for each home or contact Karen Ridenour at 512-321-2467.

- > = greater than < = less than
- For each question: The surveyor(s) can ask the homeowner these questions, contact the homeowner for permission to go onto the property for an onsite assessment, or visually determine the answer for each question from the road.
  - The main home is the focal point.
  - If you are unsure of a choice...always assume worst case scenario

#### **ROADS AND ACCESS:**

**1.** <u>Main Road Access</u> for Emergency Wildland Fire Apparatus: Determine if the main road access into the subdivision is ranked 0, 1, or 2.</u>

0: >30' road width, no vegetation obstruction

1: 20-30' road width, sparse vegetation overhang

2: <20' road width, obstructive vegetation, visible road wear

**2.** <u>Secondary Routes</u> to the Driveway: Determine if the routes within the subdivision leading to each home driveway is ranked 0, 1, or 2. Rank this selection based on the worst route leading to each home driveway.

0: 2 or more primary roads

1: 1 primary road plus an alternate, equally accessible 2<sup>nd</sup> road

2: 1 way in and 1 way out

**3.** <u>Road Width to the Driveway</u> (inclusive of vegetation clearance): Determine if the road widths within the subdivision leading to each home driveway is ranked 0, 1, or 2. Rank this selection based on the narrowest road leading to each home driveway.

0: Easily accessible 2-way road >24' wide

1: Narrow 2-way road between 20-24' wide

*3*: *1-way road <20' wide* 

**4.** <u>Maximum Grade</u> of the Secondary Route to the Driveway: Determine if the secondary routes to the driveway of each home are ranked 0, 1, 2, or 4. Rank this selection based on the steepest route to the driveway.

0: 0 to 5% 1: 6 to 8% 2: 9 to 12% 4: >12%

**5.** <u>Readable Street Name</u>: Determination of the street name should be considered from a firefighter's point of view. Is the street name easily seen and legible from the street, within an engine, under stressful conditions?

**0**: Marked AND understandable

2: Unmarked OR unreadable/not understandable

**6.** <u>Visible Identification</u> from the Road: Determination of the home identification should be considered from a firefighter's point of view. Is the house number and/or property owners (') name(s) easily viewable from the street, from an engine, under stressful conditions?

0: Name AND number readable

1: Name OR number readable

2: Name AND number missing/not readable

7. <u>Driveway Accessibility for Fire Apparatus</u>: Determine if the main driveway to the home is

ranked 0, 1, or 2. Rank this selection based on the **main** driveway to the home.

*If the driveway is gated make a note and provide highest ranking 0: 20' wide, no vegetation obstruction, solid surface* 

1: 11-19' wide, sparse vegetation obstruction, solid surface

2: <10' wide, obstructive vegetation, soft surface

#### **RESPONSE AND WATER**:

**8. Fire Department <u>Response Time</u>:** Base response times on total time it takes for the emergency response vehicle to get to the home from first call to arrival. Use location of fire department to help in determining the ranking in most cases.

0: Within 15 minutes

**2**: 16-30 minutes

*4*: > *30 minutes* 

5: No organized fire department

**9. Distance to the Closest <u>Water Hydrant</u>:** Determine locations of hydrants while in the field taking assessments. Surveyors may retrieve hydrant location information from the city or subdivision if available (i.e. feature sets for ArcMap, city maps, etc.). **Realistic hose layouts** will determine the usefulness of hydrants in the location to each home (i.e. hoses cannot generally be laid out over fences, etc).

**1**: < 1000'

2: > 1000' OR unable to determine (default)

3: Flush valve (low flow)

4: No hydrants within 1 mile

**10. Distance to Closest <u>Draft Source</u> (1500 gallons +):** Determine nearest locations for draft sources (ponds, lakes, etc) while in the field taking assessments. Surveyors may retrieve large water body locations from the city or subdivision maps (i.e. feature sets for ArcMap, city maps, state maps, etc.). Realistic engine and location accessibility (including terrain and permission from landowners) will determine the usefulness of water body locations.

1: On-site OR easy access

- 2: Within 20 minutes round trip OR unable to determine (default)
- 3: Within 45 minutes' round trip
- 4: > 45 minutes roundtrip

#### **UTILITIES:**

**11.** <u>Electricity for the Subdivision</u>: Determine how the power lines are coming into the *subdivision*. Surveyors may retrieve electrical utility information from the city or subdivision if available (i.e. feature sets for ArcMap, etc.). Visual determination of power utilities can be used if needed.

0: All underground1: Above and below ground2: All above ground

**12.** <u>Electricity to the Residence</u>: Determine how the power lines are coming into the home. Surveyors may retrieve electrical utility information from the city or subdivision if available (i.e. feature sets for ArcMap, etc.). Visual determination of power utilities can be used if needed.

0: All underground1: Above and below ground2: All above ground

**13.** <u>Propane Gas</u> Location: Assess if there is propane used on the lot by visual identification, talking with homeowners or from onsite assessments.

0: No propane on the lot

1: Downhill from the home

2: Uphill from the home

3: < 50' from the home OR unable to determine (default)

#### **DISTANCES AND FUELS:**

**14.** <u>Distance to the Closest Structure</u> (see list below): Estimate the distance to the nearest structure not attached to the main home itself. Attached buildings include: being part of the main home structure or being connected by a breezeway or overhang, which connects the two structures.

0: > 200' 1: 60-200' 2: 30-60' 3: < 30'

List of Structure Examples: "outbuildings"; barns, sheds, carports, greenhouses, and other larger structures on the main home lot such as smaller homes, apartments, or trailers. It may include the nearest main home on a nearby lot in some circumstances (if it is close enough to increase fire behavior for the home being assessed).

**15.** <u>Distance to the Closest Wildland Fuels</u>: *Estimate the distance of the main home to the nearest* wildland fuel. (Wildland fuels consist of unmanaged vegetation such as: leaf litter, dead woody material, grasses, shrubs, trees)

- 1:>300'
- 2: 100-300'
- **3**: 30-100'
- **4**: < 30'

**16.** Fuel of Predominant Vegetation ON LOT: Estimate the fuel ranking taking into account ALL vegetation on the home lot. Note: choices are based on the Anderson fuel models (the following list provides a simpler guideline).

- 0: No fuel
- 1: Short grass
- 2: Tall grass
- 2: Light brush
- 2: Deciduous &/or light brush or grass (plant that looses all its foliage for part of the year)
- 2: Evergreen &/or grass ( plant which retains its leaves year-round)
- 2: Plantation pine with seedlings (<5') (artificially planted even-aged monoculture stand of timber)
- 3: Medium brush with semi-closed canopy (limited volatile under-story plants, heavy down/dead,
  - needle litter and standing vegetation-lacking foliage)
- 3: Medium brush with evergreen closed canopy
- 3: Medium brush with deciduous
- 4: Coastal grass
- 4: Thick brush &/or closed canopy (extreme volatile under-story plants, possible heights of
  - 6-8 feet, standing vegetation has foliage)
- 4: Thick brush &/or evergreen closed canopy
- 4: Mature plantation pine with a brush understory
- 5: Plantation pine with a closed canopy (> 5')

# **17.** <u>Fuel of Predominant Vegetation IN SUBDIVISION</u>: *Estimate the fuel ranking taking into account ALL vegetation around the home lot (in the subdivision).*

- 0: No fuel
- 1: Short grass
- 2: Tall grass
- 2: Light brush
- 2: Deciduous &/or light brush or grass
- 2: Evergreen &/or grass
- 2: Plantation pine with seedlings (<5')
- 3: Medium brush with semi-closed canopy
- 3: Medium brush with evergreen closed canopy
- 3: Medium brush with deciduous
- 4: Coastal grass
- 4: Thick brush &/or closed canopy
- 4: Thick brush &/or evergreen closed canopy
- 4: Mature plantation pine with a brush understory
- 5: Plantation pine with a closed canopy (> 5')

**18.** <u>Combustible Material</u> (see list below): Document any combustible material that is stored on the home lot that could increase fire behavior in any way. Estimate the distance of this material from the main home. These materials are considered anything other than structures documented in 14. Distance to the Closest Structure and the main home itself.

**0**: Non stored on site OR > 30' from the home

*1*: < 30' from the home

2: Under or against the home

List of Possible Combustible Materials: stacks or piles of firewood, wooden fences, tires, numerous or nondrivable cars on the lot, chemicals stored on the lot (other than propane tanks), plastics stored on the lot, dried vegetation or debris laying on the lot, and yard artwork.

**19.** <u>Burn Barrel</u>: Document any evidence of a burn barrel that is stored on the home lot, which could potentially create a fire risk. Estimate the distance from the *main* home.

0: No burn barrel on the site

1: Uphill or level with the home OR unable to determine (default)

2: Downhill from the home

**TOPOGRAPHY:** (lay of the land", or the characteristics of land in terms of elevation, slope, and orientation **20. Predominant** <u>Slope</u> of the Lot: Determine if the lot has a significant slope or not, potentially increasing the fire behavior. Rank this selection based on the **most extreme topography** found on the home lot.

1: < 10% 2: 10-30% 3: 31-45% 4: > 45% (Slope: measure of change in surface elevation over a distance)

# **21. Predominant** <u>Aspect</u> of the Lot: *If there is a significant slope on the home lot*, *determine what direction the main aspect of the steepest slope on the home lot is facing.*

0: Level (flat with no slope)
1: NW to NE (North)
2: NE to SE (East)
3: SE to SW (South)
4: SW to NW (North) (Aspect: refers to the direction to which the slope faces)

**22. Distance of Home to** <u>Steep Slope</u>: *If there is a significant slope on the home lot*, *estimate the approximate distance of the main home to the crest of the steepest slope found on the lot. Significance should be dependent on the "normal" elevation and topography of the area. Slope can be defined as anything that has an aspect, which could increase fire behavior.* 

0: > 300' 1: 100-300' 2: 30-100' 3: < 30' **23. Distance to Natural Dangerous Features (see list below):** *If there is a significant dangerous natural feature, other than just a slope, on the home lot then estimates the approximate distance of the main home to the dangerous natural feature.* 

0: > 300' 1: 100-300' 2: 30-100' 3: < 30'

**List of Possible Dangerous Natural Features:** *mountains, hills, dunes, cliff walls, chimneys, canyons, box canyons, anything, other than a slope, that has an aspect which could increase fire behavior.* 

#### HOME:

**24.** <u>Defensible Space</u> Around the Home (see figure below): Estimate the area of defensible space around the main home taking into account ALL vegetation around the home itself. Take into account not only the distance of the main home to the nearest wildland fuel but also ALL paths that a wildfire could use to travel to the main home.



#### 25. <u>Manufactured Housing</u>: Determine if the home is a mobile home.

- 0: Not a manufactured house
- 1: Skirting and additional roofing
- 2: Skirting only
- 3: Not skirted

### 26. Vegetation Near or On the <u>Roof</u>: Determine the distance of the main home roof from the

nearest vegetation.

- 0: > 15' from the roof
- 1: < 15' from the roof
- 3: Overhangs or contacts the roof

# **27. Vegetation Near** <u>Chimney</u>: *If there is a chimney present, determine the distance of the main home chimney from the nearest vegetation.*

- 0: > 15' from the chimney OR no chimney
- 1: < 10' from the roof OR unable to determine (default)
- 3: Overhangs or contacts the chimney

#### 28. <u>Roofing Material</u>: Determine the type of roofing material used on the main home.

- **0**: Tile
- 1: Metal OR unable to determine (default)
- 2: Composite/asphalt
- 3: Any roof with debris
- 4: Shake shingles

# **29.** <u>Siding Material</u> (closest to wildland fuels): Determine the type of siding material used on the main home.</u>

- 0: Masonry/bricks
- 1: Full logs/composite/metal/tile OR unable to determine (default)
- 2: Fiberglass/wood sheet
- 3: Wood or rough planking
- 4: Shake shingles/cedar

**30.** <u>Window Type</u> and Material: Determine the type of window material used on the main home. Note: determination of window material can be estimated by using age of the structure or of the building materials.

- 1: Thermal glass pane AND/OR double glass pane OR unable to determine (default)
- 2: Tempered glass pane
- 3: Single glass pane

# **31.** <u>Balcony and Deck</u> (see list below): Determine if there are any balconies or decks attached to the *main* home.

a No haloomy on doo

- 0: No balcony or deck
- 1: Enclosed underneath OR unable to determine (default)
- 2: Open underneath

**32.** <u>Eaves and Overhangs</u> (see list below): *Determine if there are any eaves or overhangs attached to the main home.* 

- 0: No eaves or overhangs
- 1: Enclosed underneath OR unable to determine (default)
- 2: Open underneath

Note on Balconies and Overhangs: In the coastal areas, raised houses can be considered as having open balconies and overhangs both. This will put these houses at the proper risk category.

## Wildfire Hazard Questionnaire

Field Surveyor's Name:	Date of Survey:
Subdivision Name:	Subdivision Lot #:
Street Address:	Structure Size Sq Ft:
Fire Protection District:	
Latitude (decimal degrees):	Photo Numbers:
Longitude (decimal degrees):	Disc Number:
Was survey completed ON or OFF site:	
<b>ROADS AND ACCESS:</b> <b>1.</b> <u>Main Road</u> Access for Emergency Wildland I Good access (>30 ft road width, no vegetation obstruction) = Medium access (20-30 ft road width, sparse vegetation overh Poor access (<20 ft road width, obstructive vegetation, visible	Fire Apparatus: 0, ang) = 1, e  road wear) = 2
<ul> <li>2. Secondary Road to the Driveway:</li> <li>2 or more primary roads = 0,</li> <li>1 primary route plus an alternate = 1</li> <li>1 way in and out = 2</li> </ul>	
<b>3.</b> <u>Road Width to the Driveway</u> (inclusive of veg Good 2-way road greater than 24 ft wide = 0 Narrow 2-way road between 20-24 ft wide = 1 1-way road less than 20 ft wide = 3	etation clearance):
4. <u>Maximum Grade</u> of the Primary Route to the 0 to $5\% = 0$ , 6 to $8\% = 1$ , 9 to $12\% = 2$ , More than $12\% = 4$	e Driveway:
<b>5.</b> <u>Readable Street Name</u> : Marked – AND – understandable = 0 Unmarked – OR – not understandable = 2	
6. <u>Visible Identification</u> from the Road: Name – AND – number readable = 0 Name – OR – number readable = 1 Name – AND – number missing or not readable = 2	
7. Driveway Accessibility for fire apparatus: Good: 20 ft wide, no vegetation obstruction, paved = 0 Medium: 11-19 ft wide, some vegetation obstruction, solid su Poor: $\leq 10$ ft wide, vegetation obstruction, soft surface = 2	urface = 1

#### **RESPONSE AND WATER:**

8. Fire Department <u>Response Time</u>:

o. The Department <u>R</u>	csponse i me.
Within 15 minutes $= 0$ ,	Within 16 to 30 minutes $= 2$
More than 30 minutes $= 4$ ,	No organized $FD = 5$
9. Distance to closest V	Water Hvdrant:
Unable to determine = $2$	
Less than $1000$ feet = 1	
More than 1000 feet = $2$	
Flush valve (low flow) = $3$	
No hydrants within 1 mile =	4
10. Distance to closest	<u>Draft Source</u> (1500 gallons +):
Unable to determine $= 2$	
On-site or easy $access = 1$	
Within 20 minutes round trip	p = 2
Within 45 minutes round trip	b = 3
More than 45 minutes round	trip = 4
<b>UTILITIES:</b>	
<b>11. Electricity for the </b> <i>S</i>	Subdivision:

All underground = 0 Above & Below ground = 1 All Above ground = 2

#### 12. Electricity to the Residence:

All underground = 0 Above & Below ground = 1 All Above ground = 2

#### 13. Propane Gas Location:

No propane = 0 Downhill from house = 1 Uphill from house = 2 Less than 50/Unable to Determine = 3

#### **DISTANCES AND FUELS:**

14. Distance to the closest Structure (outbuilding, barns, etc):

More than 200 feet = 0 60 to 200 feet = 1 30 to 60 feet = 2 Less than 30 feet = 3

#### 15. Distance to closest Wildland Fuels:

More than 300 feet = 1 100 to 300 feet = 2 30 to 100 feet = 3 Less than 30 feet = 4

#### 16. Fuel of predominant vegetation ON LOT:

No fuel $= 0$	Evergreen/grass = 2
Short grass $= 1$	Evergreen closed canopy/med brush = $3$
Tall grass = $2$	Evergreen closed canopy/thick brush = $4$
Coast grass $= 4$	Plantation Pine/seedlings $< 5$ ft $= 2$
Light brush $= 2$	Plantation Pine/closed canopy $(5 \text{ to } 30 \text{ ft}) = 5$
*Med brush/semi-closed canopy = 3	Mature Plantation Pine/brush understory = 4
*Thick brush /closed canopy = 4	Deciduous/brush = 3
Deciduous /light brush or grass = $2$	

#### 17. Fuel of predominate vegetation in SUBDIVISION:

Evergreen/grass = 2

Deciduous/brush = 3

Evergreen closed canopy/med brush = 3

Evergreen closed canopy/thick brush = 4

Plantation Pine/closed canopy (5 to 30 ft) = 5

Mature Plantation Pine/brush understory = 4

Plantation Pine/seedlings < 5 ft = 2

No fuel = 0 Short grass = 1 Tall grass = 2 Coast grass = 4 Light brush = 2 Med brush/semi-closed canopy = 3 Thick brush /closed canopy = 4 Deciduous /light brush or grass = 2

#### 18. Combustible Materials:

Non stored on site = 0 More than 30 feet from home = 0 Less than 30 feet from home = 1 Under or against the home =2

#### 19. Burn Barrel:

No burn barrel on site = 0 Uphill from or level with home = 1 Downhill from home = 2

#### **TOPOGRAPHY:**

### 20. Predominant <u>Slope</u> of the Lot:

Less than 10% = 110 to 30% = 231 to 45% = 3More than 45% = 4

#### 21. Predominant Aspect of the Lot:

Level (flat with no slope) = 0 NW to NE (North) = 1 NE to SE (East) = 2 SE to SW (South) = 3 SW to NW (North) = 4

#### 22. Distance of Home to Steep Slope:

More than 300 feet = 0 100 to 300 feet = 1 30 to 100 feet = 2 Less than 30 feet = 3

\*Medium brush – limited volatile understory plants, heavy down/dead, needle litter and standing vegetation-lacking foliage \*Thick brush – extreme volatile understory plants, possible heights of 6-8 feet, standing vegetation has foliage



#### 23. Distance to <u>Natural Dangerous Feature</u> (canyons, chimneys, etc):

More than 300 feet = 100 to 300 feet = 30 to 100 feet = Less than 30 feet =

#### HOME:

#### **24.** <u>Defensible Space</u> around the Home: More than 200 feet = 0 100 to 200 feet = 1 60 to 100 feet = 2

30 to 60 feet = 3Less than 30 feet = 4

#### 25. Manufactured Housing:

Not a manufactured house = 0 Skirting and additional roof = 1 Skirting ONLY = 2 Not Skirted = 3

#### 26. Vegetation Near or On the Roof:

More than 15 feet from roof = 0Less than 15 feet from roof = 1Overhangs/Contact with roof = 3

#### 27. Vegetation near <u>Chimney</u>:

More than 15 feet from chimney OR No chimney = 0 Less than 10 feet from chimney = 1 Contact with chimney = 3

#### 28. Roofing Material:

Unable to determine $= 1$	Composite/Asphalt = 2
Tile = 0	Any Roof with Debris $= 3$
Metal = 1	Shake shingles $= 4$

#### 29. Siding Material (closest to wildland fuels):

Unable to determine = 1 Full logs = 1 Fiberglass/wood sheet = 2 Shake shingles/cedar =4

### Masonry/bricks = 0 Composite/metal/tile = 1 Wood or rough planking = 3

#### 30. Window type and Material:

Unable to determine $= 1$	Tempered glass pane = $1$
Thermal pane = 2	Double glass pane = $2$
Single glass pane $= 3$	

#### 31. Balcony and Decks:

No balcony or deck = 0

Enclosed underneath = 1

Open underneath = 2

#### 32. Eaves and Overhangs:

Unable to determine $= 1$	No eaves/overhangs = $0$
Enclosed underneath $= 1$	Open underneath $= 2$