



CANADIAN COUNTY

Darlington Public School

2012 Multi-Hazard Mitigation Plan Update



Flanagan & Associates, LLC
Planning Consultants

Acknowledgements

The Darlington Public School Multi-Hazards Mitigation Plan 2012 Update was made possible by a Hazard Mitigation Grant from the Oklahoma Department of Emergency Management and the Federal Emergency Management Agency, with local share funding from Darlington Public School.

The Plan was prepared by Canadian County and Darlington Public School under the direction of the Canadian County Commissioner's Office, with the participation and assistance of numerous agencies, organizations, and individuals, including:

Darlington School Board

Member Lloyd Wehmuller
Member Jim Hrdy
Member DeForest Tallbear

Darlington School Administration

School Superintendent Jimmie Smith

Darlington School Staff Technical Advisory Committee (STAC)

21st Century Director Glenn Meriwether

G.4 Darlington School District

Darlington School District serves north-central Canadian County as shown in Locator Map Figure G.4-1. Darlington School is located at 4408 N. Highway 81 near El Reno. The main building is built of cinder block, with four modular, metal-clad classrooms. The School has a 250-person capacity safe room and an underground shelter with a capacity of 75. The windows are being replaced with hail-resistant glass, and 70 percent of the roof is covered with thermoplastic polyolefin (TPO) roofing, to provide a heat-reflective, energy efficient covering. The School has a sprinkler system and a NOAA Weather Radio. There is no bus barn, no lightning protection, and no backup generator.

Section 1 Introduction

1.1 Services Summary

The District provides public education services for Pre-K through Grade 8.

1.2 Boundaries

The School District extends from the North Canadian River north to near 164th St. NW, including a six square mile northwestern section to just beyond 206th St. NW; and from near Heaston Rd. eastward to about Manning Rd. A Base Map of the District is in Figure G.4-2

1.3 Population Summary

The District population is 579. Table G.4-1 summarizes the enrollment, staff and location for Darlington School for 2010-2011.

Figure G.4-1 Darlington School District Locator Map

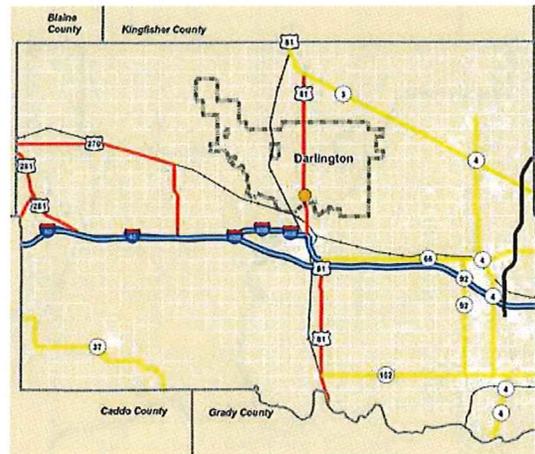


Table G.4-1 Darlington School Enrollment, 2010-2011

School	Address	Grades	Students	Staff
Darlington School	4408 N Highway 81, El Reno	Pre-K-8th	238	16

School District Demographics

Ethnicity

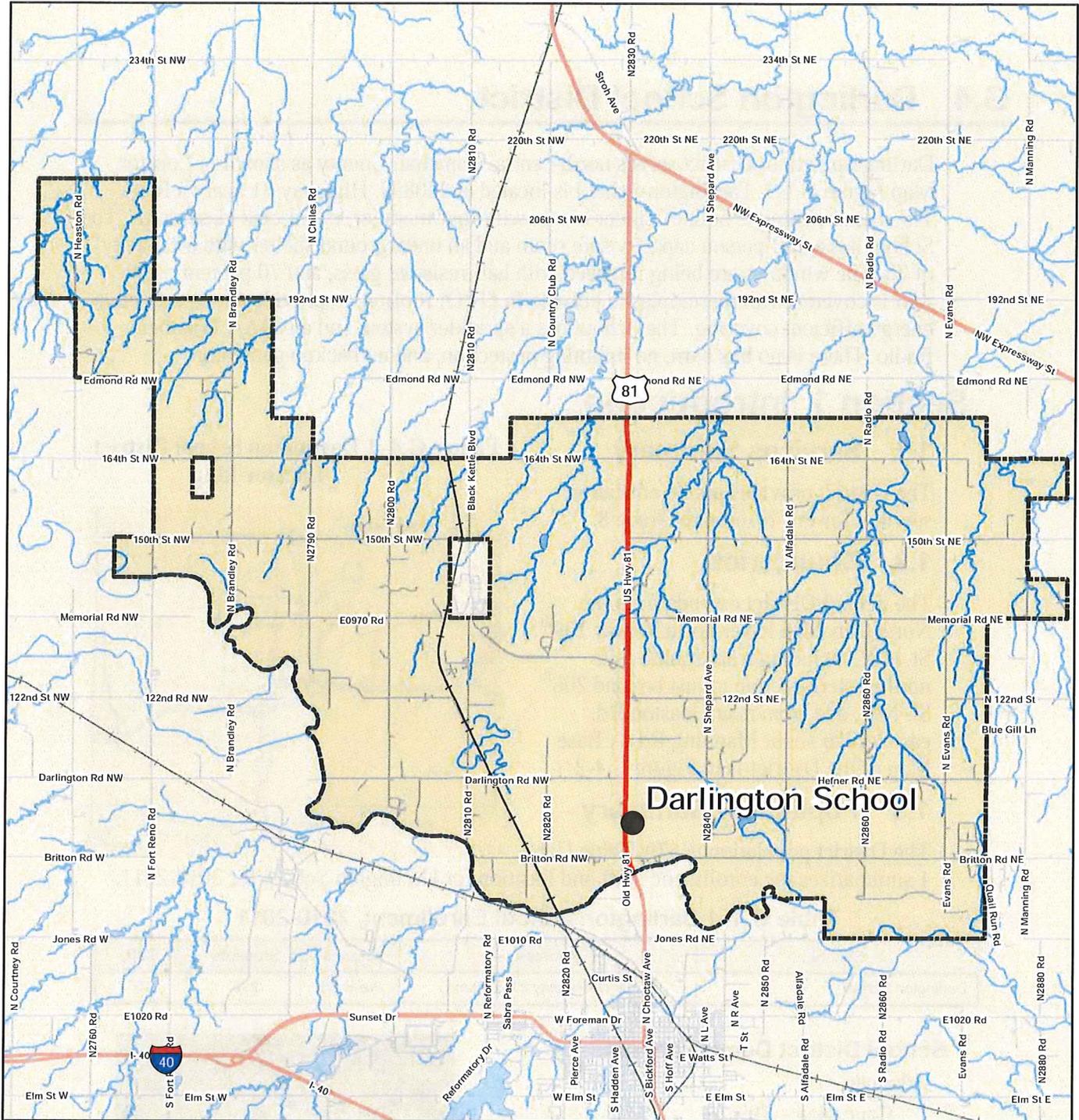
- Caucasian – 19%
- Native American – 76%
- Hispanic – 4%
- African American – 0%
- Asian – 1%

Other Census Data

- Poverty Rate – 5%
- Unemployment Rate – 2%
- Single Parent Families – 12%



Darlington Public Schools



LEGEND

-  Highways
-  Darlington Public Schools
-  Darlington School Dist.
-  Roads
-  Railroads
-  Water Bodies



Figure G.4-2
 Darlington Public Schools
 Basemap



0 1.25 2.5 Miles

1.4 Economic Summary

Chapter 2.2.1 expresses the general governing, financing and policy-making authority of public boards of education in Oklahoma.

Darlington School District has experienced only modest growth in both population and in enrollment. The net assessed valuation of the District fluctuates due to varying trends in oil and gas activity in the District. The District has a 40-turbine wind farm that is planning an expansion in the near future, which will be beneficial to the tax base.

At the writing of this plan, the District has a healthy building fund. The District relies on State aid and 40% of its funding comes from Federal government sources. The District has not presented a bond issue to its patrons in 40 years, which makes prediction of voter sentiment on a future bond issue for capital improvements difficult to assess.

Section 2 Existing Mitigation Strategies

National Flood Insurance Program/Community Rating System. Darlington Public Schools are covered by the unincorporated area of the county's participation in the NFIP program but they are not participants in the CRS Program.

Floodplain Management. Darlington Public Schools participates in and benefits from unincorporated Canadian County regulations for the floodplains.

StormReady Program. Darlington Public Schools is not a StormReady community.

FireWise Program. Darlington Public Schools does not participate in the FireWise Program.

Building Codes. Darlington Public Schools abides by the codes governing the county and the states required codes for the schools.

Emergency Services

Security. Darlington Public Schools has authorized the Superintendent or Principal of the school to enforce security.

Fire Protection. The El Reno fire department would be responsible for responding to a fire at Darlington Public Schools.

Hospitals. The closest hospital is Parkview Hospital in El Reno.

Ambulance Service. Parkview Hospital provides ambulance service for Darlington Public Schools.

Section 3 Hazards

The following subsections discuss hazard information for the School District and the School site. The maps show site-specific hazard data in relationship to the School District as a whole and site specific hazard information for the School.

General natural hazards, such as Tornadoes, High Winds, Lightning, Hail, Winter Storms, Extreme Heat, Drought, and Earthquakes, affect the County more or less randomly and equally, with little difference between a particular School District and the County as a whole. These general hazards are addressed more fully in Chapter 4.

Table G.4–2 Darlington Public Schools Hazards Summary

Name	Floods	Tornadoes	High Winds	Lightning	Hail	Winter Storms	Extreme Heat	Drought	Expansive Soils	Urban Fires	Wildfires	Earthquakes	Hazardous Material Sites	Dam Failures	Transportation Hazards
Darlington Public Schools		X	X	X	X	X	X	X	X	X	X	X		X	X

3.1 Flood

Darlington Schools are located on the east side of US Highway 81, between Britton Rd. and Darlington Rd., a half mile north of the North Canadian River, which flows through the area at about elevation 1,300. Darlington Schools are just above elevation 1,320. The 100-year flood zone in this reach of the North Canadian River is at elevation 1,312. There have been no significant drainage issues or overland flooding problems at the School. No flood events in Canadian County are reported to have had any impact on Darlington Public School. Given this data, Darlington School has no vulnerability to and no probability of the Flood hazard.

3.2 Tornado

Tornadoes are a random hazard that can strike anywhere in Canadian County, including Darlington Public Schools. Canadian County experienced 34 tornadoes between 1995 and 2010, including a devastating EF5 tornado in May 2011. Given these frequencies, the County can expect 2.3 tornadoes each year, any one of which could impact Darlington School. Darlington sustained significant damage from a tornado in May of 2011. The school has a 250-person capacity safe room and an underground shelter with a capacity of 75. The safe room can provide near-absolute protection to its occupants during periods of inclement weather. NOAA weather radios provide the students, staff, and faculty adequate warning time to seek shelter. The school has four modular classrooms which, as discussed in Chapter 4, are extremely vulnerable to tornadoes and high wind speeds. A direct hit by a tornado like the EF5 that passed through parts of El Reno and Piedmont in May 2011 would completely destroy the School structures aside from the safe room facility. Darlington Public Schools consider a minor severity tornado to be less than an EF2 on the Enhanced Fujita Scale and a major severity to be an EF2 or higher. Darlington School is considered to have a High vulnerability to and High probability of the Tornado hazard.

3.3 High Wind

Like Tornadoes, High Winds are a general hazard that occurs commonly and randomly throughout Canadian County. The County reported 73 high wind events from 1995 through 2010. Straight-line winds as high as 95 mph have been reported in the County. Like the County, Darlington School can expect about five potentially damaging high wind events each year. In the past, Darlington school has received damage to the roof, vent cap, HVAC equipment, doors, vehicle and fence damage due to high winds. The School is installing shatter-resistant glass in its buildings as older windows are replaced. As discussed in Chapter 4, high wind events can cause substantial damages to school structural components. Darlington Public School considers a minor severity wind event to be a 9 or lower on the Beaufort Scale (Strong Gale, below 54 mph), and a major severity storm to be above 9 on the Beaufort Scale (Whole Gale/Storm) with winds 55-mph and higher. Darlington School has a High vulnerability to and High probability of the High Wind hazard.

3.4 Lightning

Lightning is another general hazard that accompanies severe thunderstorms. Canadian County reported nine damaging lightning events between 1995 and 2010 generated by the approximately 76 severe thunderstorms that passed through the area. Darlington School can expect about five lightning events per year. Darlington Public Schools have not been impacted by lightning events in the past. The school has no lightning detection equipment leaving students, staff, and faculty participating in outside events vulnerable to lightning strikes. The school also does not have lightning protection, such as surge protection, leaving the school infrastructure, especially computers with sensitive data on file, at risk of being completely lost or destroyed. Based on the information provided by the National Weather Service, Chapter 4, Darlington Public Schools considers a negative cloud-to-ground flash with multiple return strokes, that causes no loss of life or injury and less than \$1,000 in property damage, to be a minor severity lightning event; and a positive cloud-to-ground flash with a continuous or high peak current, that causes loss of life and/or injury and more than \$1,000 property damage, to be a major severity lightning event. The Schools have a High vulnerability to and High probability of the Lightning hazard.

3.5 Hail

Hail is a general hazard that strikes randomly and more or less equally throughout the County, along with lightning, high winds and tornadoes. From 1995 through 2010, Canadian County reported 105 separate hail events. Given this frequency, Darlington Schools can expect as many as seven hail events each year. In the past, the School has received some type of roof damage; vent cap, HVAC, vehicle and fence damage due to hail. Darlington School is installing shatter-resistant glass as old windows are replaced, and has covered the main building with TPO roofing. As discussed in Chapter 4, large hail can damage school busses and render them non-operational. Darlington School has no bus barn or covered parking. Darlington Public School considers a minor severity to be an H2 or lower on the Combined NOAA/TORRO Hailstorm Intensity Scales, and a major severity to be an H3 or higher. The School is considered to have a High vulnerability to and High probability of the Hail hazard.

3.6 Winter Storm

From 1995 through 2010 Canadian County experienced 35 ice and snow events, or an average of 2.3 winter storms each year. Because of the general and widespread nature of winter storms, it is assumed that Darlington School also experienced 35 ice and snow events in this period. As indicated in Chapter 4 of this plan, public schools are in any case not in session during severe winter storms due to an allotted number of snow days so the populations are not immediately at risk. Darlington School has been cancelled in the past due to snow/ice storms. No specific damages to the school itself were known by staff at the school or news reports. Darlington School is not equipped with back-up generators. Loss of power could result to extended closure of school facilities. Darlington Public School considers a minor severity winter storm to be a Level 2 event or below (ice accumulation of less than ¼ inch—see Table 4-21), and a major severity event to be Level 3 and above (ice accumulation above ¼ inch) resulting in power outages and hazardous travel conditions. Darlington Public School has a High vulnerability to and High probability of the Winter Storm hazard.

3.7 Extreme Heat

During the period 1996 through 2011, Canadian County experienced four extreme heat events or an average of one every 3.7 years. Because of the general and widespread nature of heat waves, it is assumed that Darlington School experienced the same number of extreme heat events as the rest of the County. Generally, public schools are not in session during the peak of the extreme heat season. However, as discussed in more detail in Chapter 4, athletes participating in school sports practices and events remain at risk of loss of life or injury. Extreme heat has caused power outages and HVAC failure at Darlington School in the past. Darlington Public Schools considers a minor severity heat event to be a heat index of 95 or less and a major severity to be a heat index greater than 95 for a period of two or more weeks. Darlington School has a Low vulnerability to and High probability of the Extreme Heat hazard.

3.8 Drought

Canadian County experienced four droughts from 1996 to 2011. Given the widespread nature of the hazard, it can be assumed that Darlington School has experienced the same number of droughts. The School receives its water from Canadian County Rural Water District 4. Partly because school is not in session during summer, the drought of 2010-2011 caused loss of trees, shrubs, flowers and grass at the school. The greatest impacts on the school structures themselves would be from secondary hazard impacts such as wildfires or expansive soils; more detailed information about the impact of these hazards can be found in Chapter 4. Darlington Public School considers a minor severity drought to be mild or moderate on the Palmer Index, and a major severity event to be a Severe or Extreme drought on the Index, which results in crop loss or restrictions on water use. No damages caused by drought have been reported by Darlington Public Schools. Darlington School is considered to have a Low vulnerability to and Moderate probability of the Drought hazard.

3.9 Expansive Soils

Darlington Public School is situated largely on highly expansive soils. There have been some settling impacts to the School due to expansive soils. No losses have been recorded by the district as a result of expansive soil. Any future damages will be included, as made available, in the next plan update. Darlington Public School considers a shrink-swell level of moderate and below to be a minor severity and a shrink-swell level of high and above to be a major severity. Darlington School is considered to have a Moderate vulnerability to and High probability of the Expansive Soils hazard.

3.10 Urban Fire

Darlington School is in the El Reno Fire District. El Reno's Fire Department has 19 fire fighters operating in a 154-square-mile district. The Department's ISO rating is 4. A fire hydrant is located at the school site. The school is equipped with a fire sprinkler system. Darlington Public School considers an event of minor severity to be \$5,000 or less in damages and no loss of life or injury and a major severity event to be more than \$5,000 in damages and/or loss of life or injury. Darlington Public Schools have not been impact by fires in the past. Due to the adequate fire protection and fire suppression capabilities the school is protected by, Darlington School is considered to have a Low vulnerability to and High probability of the Urban Fire hazard.

3.11 Wildfire

Darlington School is located on the east side of US Highway 81, between Britton Rd. and Darlington Rd. The School is buffered west by US Highway 81 and parking lots, to the south and north by agricultural land, and to the east by landscaped playing fields. A fire hydrant is located at the school site. The school is equipped with a fire sprinkler system. Darlington Public Schools considers a reading of moderate and below on the Fire Danger Rating system (Table 4-36) to be a minor severity level and a rating of high and above to be of major severity. There are no reports of wildfire events causing damages to Darlington Public Schools in the past. Due to the adequate fire protection and fire suppression capabilities the school is protected by; Darlington School is considered to have a Low vulnerability to and Low probability of the Wildfire hazard.

3.12 Earthquake

Earthquakes are considered a general hazard that is relatively unpredictable and not site-specific, since it usually impacts a wide area. Canadian County recorded 28 earthquakes between 1995 and 2009, followed by cluster of 11 quakes on March 11-12, 2010. Thirteen of these events were in or very close to El Reno. The greatest recorded quake in Oklahoma, a 5.6 event, occurred recently (November 2011) in Lincoln County. Prior to this quake, the highest magnitude tremor (5.5) was at El Reno in 1952. Of the earthquakes that have occurred in Canadian County, none are reported to have caused damages to Darlington Public Schools. As indicated in the HAZUS analysis in Chapter 4, an earthquake would cause no to minimal damages to any Canadian County school facilities. Darlington Public School considers a reading of 4.8 and below on the Richter Scale a minor severity quake and a reading above 4.8 to be one of major severity. Darlington School is considered to have a Low vulnerability to and Low probability of the Earthquake hazard.

3.13 Hazardous Materials

There are two Tier II sites in the Darlington Public School District, but the closest of these is about five miles north of the School on US Highway 81, and the other eight miles distant, on Ft. Reno Rd., between 150th and 164th St. NW. Neither of these sites poses a threat to School facilities, students or staff. There are no reports of Hazardous Material events impacting Darlington Public Schools in the past. Darlington School has no vulnerability to and no probability of the Fixed-Site Hazardous Materials hazard.

3.14 Dam Failure

Darlington School is situated on the north side of the North Canadian River, at elevation 1,320. Upstream are four dams that impound the North Canadian River or its tributaries. The greatest threat would be from a failure of, or emergency release of 87,000 cfs from, Canton Dam during a flood of record. An emergency release of this magnitude is not unprecedented. In May 1951 the US Army Corps of Engineers was forced to release 80,000 cfs into the North Canadian from Canton Lake. The flood of record occurred in 1923, 25 years *before* the Canton Dam was completed on the North Canadian River. However, under peak flood conditions, a failure could push the river to 32 feet and inundate much of the floodplain, low-lying neighborhoods and railroad facilities near El Reno. If the river were already in flood downstream, the release surge at El Reno would rival the 1923 flood. A release of this size would take 83 hours to reach the School, however, so there would be adequate time for evacuations and preparations. A detailed hydrological study would be required to determine the precise impacts of such an event for Darlington School. Darlington Schools have not been impacted by the Dam Failure hazard in the past. Darlington Public Schools considers a minor severity dam event to be an extraordinary release that results in less than three feet of flooding on a one story building, and a major severity dam event to be a breach or failure that exceeds the capacity of the Dam's downstream riverbed immediately downstream from the dam and/or equates to (or exceeds) a 100- or 500-year flood and results in a depth of three feet of flooding or more on a one story building. Based upon historical and current data, Darlington School has a Low vulnerability to and Low probability of the Dam Failure hazard.

3.15 Transportation

Darlington School is located on US Highway 81, midway between Britton Rd. NE and Darlington Rd. NW. The daily traffic count on US Highway 81 (two miles north of Darlington Schools) is 5,900 vehicles a day. US Highway 81 is a four-lane divided expressway between El Reno and OK Highway 3, and is a transport corridor for hazardous materials. The School site set back about 300 feet from the highway. The Union Pacific railroad is about 1.5 miles east of the School. A natural gas liquids pipeline follows Darlington Rd. NW, about a half mile north of the School property. The greatest transportation risk to Darlington School would be from a hazardous materials tanker truck accident on US Highway 81. The impact of this hazard on the built environment is detailed more fully in Chapter 4. Darlington Public School considers a minor severity Transportation incident to be one that results in inconvenience (such as traffic delays), minor injury, and some financial loss (less than \$50,000), and a major severity event to be one that requires immediate intervention to save lives and property, and/or results in

serious injury or death, or significant financial loss (greater than \$50,000). There are no reports of Darlington Schools being impact by this hazard in the past. Darlington School is considered to have a Moderate vulnerability to and High probability of the Transportation hazard.

3.16 Hazards Summary

To provide a visual perspective of all potential hazards within the boundaries of the entire Darlington School District, a District-wide Hazards Composite Map is presented in Figure G.4-3.

Figure G.4-4 focuses on the Schools site itself and illustrates the specific hazards and their individual level of potential impact on the buildings and their immediately surrounding area. Please note the legend accompanying Figure G.4-4 to identify individual hazards and be aware that the colors in the map may appear different due to the number of other colors that have been overlaid representing other potential hazards, thus creating a Schools-site composite.

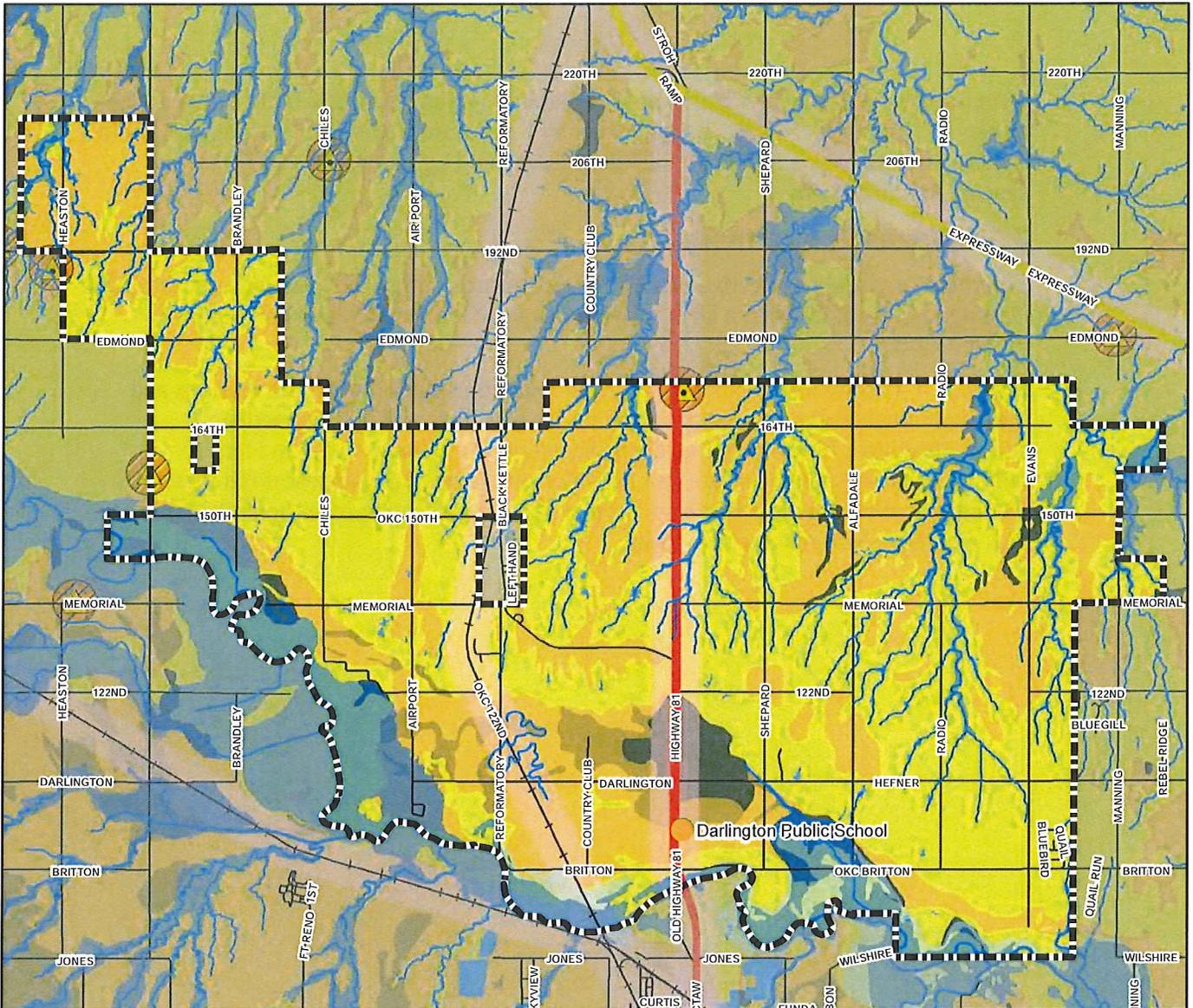


Figure G.4-3:

*Darlington School District
Hazard Composite*

- PreK
- Elementary School
- Middle School
- ◆ High School
- Rural School
- Public School Admin
- Development Center
- Other

Hazard Overlays

- ▲ 2009 EHS Tier 2
- ▲ 2009 non EHS Tier 2
- ▨ Tier2 1/4mi Buffer
- 100yr Floodplain
- 500yr Floodplain
- Quarter Mile Transportation Buffer

Expansive Soils

- Low
- Moderate
- High
- Very High
- Water

Transportation

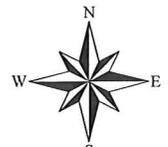
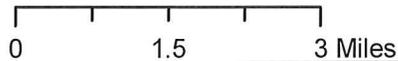
- Interstate
- US Highway
- State Highway
- Turnpike
- Local or Rural Road
- Railroads

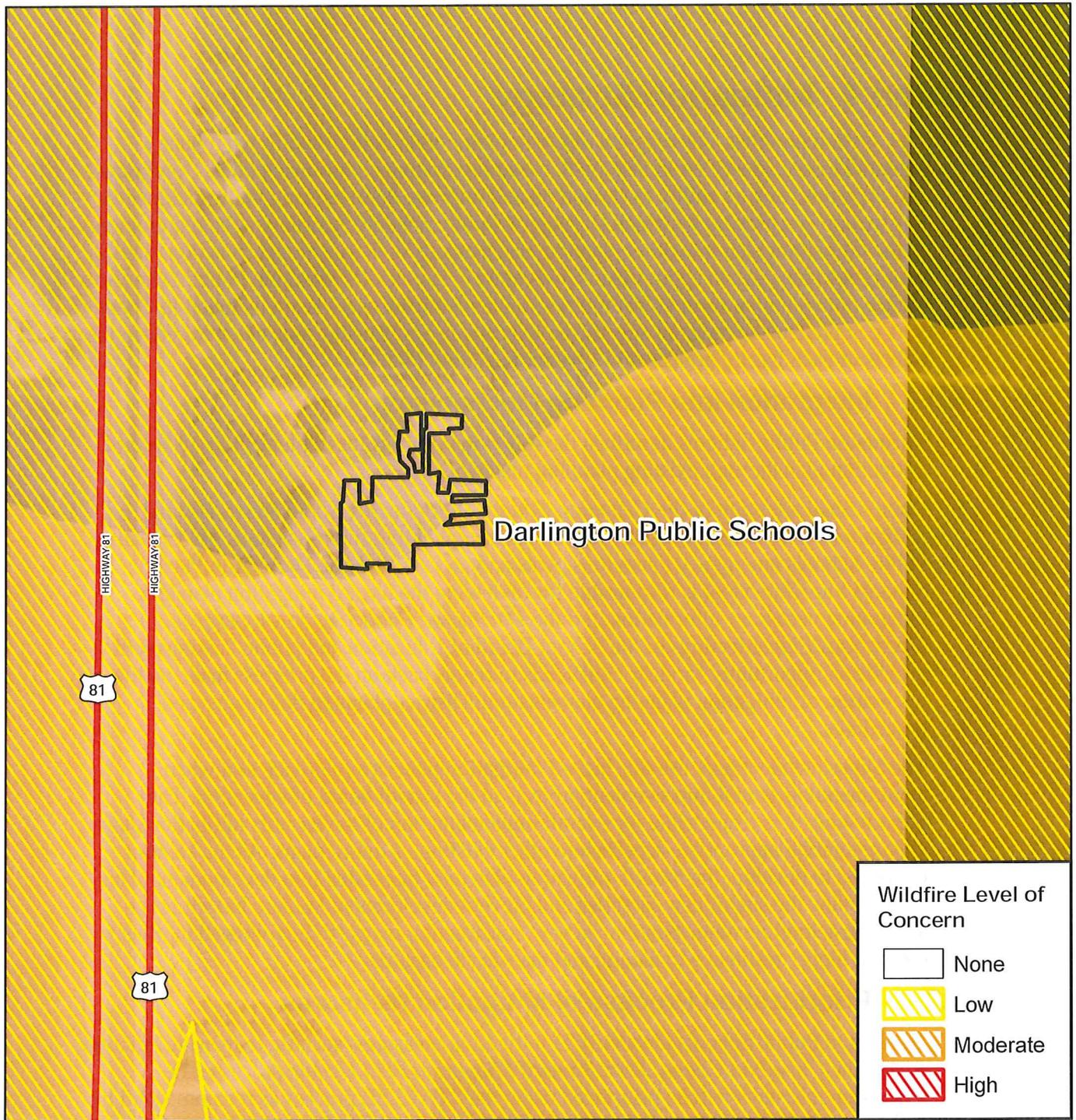
Boundaries

- ▬ Darlington School District



Flanagan & Associates, LLC
Planning Consultants





Wildfire Level of Concern

-  None
-  Low
-  Moderate
-  High

LEGEND

 Interstate	 Expansive Soils Low
 US Highway	 Moderate
 State Highway	 High
 Turnpike	 Very High
 Railroads	 Water
 Roads	 100yr Floodplain
 1/4mi Transport Buffer	

0 100 200 Feet





Figure G.4-4
Darlington Public Schools
Composite Map - Detail

Section 4 Mitigation Strategy

This section provides a description of Darlington Public Schools ability to reduce potential losses, identified in Section 3, based on existing authorities, policies, programs, and resources, and its ability to expand on and improve these existing tools. Included in this section is a process by which Darlington Public Schools incorporate the requirements of the mitigation plan into other planning mechanisms such as emergency action plans or long range plans, when appropriate. Goals and objectives of Darlington Public Schools to reduce or avoid long-term vulnerabilities to the identified hazards are included in Chapter 5. A comprehensive range of specific actions and projects being considered to reduce the effects of each hazard are listed in Chapter 6, Action Plan.

4.1 Integration into Planning Mechanisms

Darlington Public Schools described the following process for implementing its hazard mitigation plan through existing planning mechanisms:

Upon formal adoption of the *Canadian County Multi-Jurisdictional Multi-Hazard Mitigation Plan*, mitigation goals will be incorporated into future versions of Darlington Public Schools emergency operations plans and procedures. The Darlington Public Schools Superintendent is responsible for reviewing the hazard mitigation plan and integrating necessary information into the *Darlington Public Schools Emergency Operations Plan*. Meetings of the School Board of Education and public hearings will provide an opportunity for district officials to report back on the progress made on the integration of mitigation planning elements into District planning documents and procedures.

The Superintendent may use this hazard mitigation plan as a reference tool when recommending school improvement projects to the school board of education. The Superintendent is responsible for overall implementation of the hazards mitigation plan and integrating appropriate aspects into other existing or future plans. As the District continues to develop, the hazard mitigation plan may integrated into development plans to determine the site of new facilities and prevent development in more hazard prone areas. Structural recommendations in new construction may also be followed in order to create a higher resiliency to natural and man-made hazards.

4.2 Prioritization Process of Mitigation Measures

Darlington Public Schools identified 21 mitigation measures, specific to their jurisdiction, during the *Canadian County Multi-Hazard Mitigation Plan Update* process. The mitigation measures will be prioritized using the STAPLEE process as recommended by FEMA, included in Chapter 5, Table 5-1. Complete detailed information for each mitigation measure is included in Chapter 6.