



Draft Environmental Assessment

Fire Station 19

ARRA – AFFSCG Grant EMW-2009-FC-03365R

Winston-Salem Fire Department

June 23, 2011



FEMA

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ENVIRONMENTAL ASSESSMENT

**PROPOSED FIRE STATION 19
WINSTON-SALEM, NORTH CAROLINA
ARRA – AFFSCG GRANT EMW-2009-FC-03365R**

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LIST OF ACRONYMS

ACHP	Advisory Council on Historic Preservation
AFFSCG	Assistance to Firefighters Fire Station Construction Grants
ARRA	American Recovery and Reinvestment Act
BMPs	Best Management Practices
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
DWQ	Division of Water Quality
EA	Environmental Assessment
EIS	Environmental Impact Statement
EPA	Environmental Protection Agency
ESA	Endangered Species Act
ESCP	Erosion and Sedimentation Control Plan
FEMA	Federal Emergency Management Agency
FIRM	Flood Insurance Rate Map
FONSI	Finding of No Significant Impact
FPPA	Farmland Protection Policy Act
HSA	Historic Sites Act
MACTEC	MACTEC Engineering and Consulting, Inc.
NAAQS	National Ambient Air Quality Standard
NCA	Noise Control Act
NCAC	North Carolina Administrative Code
NCDENR	North Carolina Department of Environment and Natural Resources
NCDOT	North Carolina Department of Transportation
NEPA	National Environmental Policy Act
NFPA	National Fire Protection Agency
NGVD	National Geodetic Vertical Datum
NHP	Natural Heritage Program
NHPA	National Historic Preservation Act
NOAA	National Oceanic and Atmospheric Administration
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
NWI	National Wetlands Inventory
OSA	Office of State Archaeology
SHPO	State Historic Preservation Office
SWMS	Stormwater Management System
USACE	United States Army Corps of Engineers
USC	United States Code
USDA	United States Department of Agriculture
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
WSDOT	Winston-Salem Department of Transportation

1.0 INTRODUCTION

The Winston-Salem Fire Department is a recipient of federal grant funding from the Federal Emergency Management Agency (FEMA), as provided under the American Recovery and Reinvestment Act of 2009 (ARRA) and the Assistance to Firefighters Fire Station Construction Grants (AFFSCG), for the construction of a new fire station within the Winston-Salem city limits. The ARRA – AFFSCG grant for the Fire Station 19 project is EMW-2009-FC-03365R. A new fire station located at the proposed site (4430 Glenn Hi Road, Winston-Salem) would allow the Winston-Salem Fire Department to serve its citizens better and deal with increasing service demand from expected extensive residential and commercial growth. The proposed project would have a direct and immediate effect on protecting the lives and property within the target service area because of enhanced response capabilities. MACTEC Engineering and Consulting, Inc. (MACTEC) has prepared this Environmental Assessment (EA) document for the Fire Station 19 project on behalf of the Winston-Salem Fire Department and the City of Winston-Salem.

This EA has been prepared in accordance with the National Environmental Policy Act (NEPA) of 1969, the President's Council on Environmental Quality (CEQ) regulations to implement NEPA (40 Code of Federal Regulations [CFR] Parts 1500-1508), and FEMA's regulations implementing NEPA (44 CFR Part 10). FEMA is required to consider potential environmental impacts before funding or approving actions and projects. The purpose of this EA is to analyze the potential environmental impacts of the proposed Fire Station 19 project. FEMA will use the findings in this EA to determine if an Environmental Impact Statement (EIS) is required, or if the project can be authorized under a Finding of No Significant Impact (FONSI).

2.0 PURPOSE AND NEED

2.1 Purpose

The ARRA is an economic stimulus package that was designed to revive the U.S. economy, create or save millions of jobs, and facilitate addressing long-neglected challenges at the national level in the wake of the recession. Funds received under the ARRA are intended to support these goals. The purpose of the ARRA – AFFSCG is to create or save jobs in areas where the recession has affected employment and the local economy, as well as to achieve AFFSCG goals of firefighter safety and improved response capability/capacity based on need through the construction, renovation, or modification of fire stations. Since 2001, AFFSCG has helped firefighters and other first responders to obtain critically needed equipment, protective gear, emergency vehicles, training, and other resources needed to protect the public and emergency personnel from fire and related hazards (FEMA 2010a). The purpose of the proposed project is to help address the below outlined needs in the City of Winston-Salem.

2.2 Need

The City of Winston-Salem began annexing portions of Forsyth County on the east-southeast side of the county in the early 1990's. In 2006, the remaining sections were annexed, thereby creating a fire home territory of approximately 8 square miles. Currently, Engine Company 19 serves this portion of Winston-Salem. Engine Company 19 is housed in the Beeson Crossroads Volunteer Fire Department building, which is located in the neighboring town of Kernersville (1105 Old Salem Road, Kernersville, North Carolina 27284). At the Beeson Crossroads location, Engine Company 19 exists outside of its home territory and the city limits of Winston-Salem. Engine Company 19 is manned 24/7 in three shifts and has operated out of the Beeson Crossroads building for six years. Engine Company 19 shares sleeping quarters, kitchen, and training space with the volunteer fire department, as well as a bay for one engine. This housing arrangement has burdened the day to day operations and response service capabilities of Engine Company 19.

In the last eight years, the area on the east-southeast side of Forsyth County has increased in population

by 51% and development projections indicate that extensive residential and commercial growth will continue to occur (N. Kelker, Personal Communication, October 25, 2010). The existing fire station location at Beeson Crossroads currently prevents the Winston-Salem Fire Department from providing the same level of service that the department offers in other station territories. At the present time, Winston-Salem Fire Department 'citywide response time' averages four minutes for the first firefighters on scene. The Beeson Crossroads station is outside of the home territory, north east of the optimum station location for emergency response, and on the far side of where demand is heaviest. With this set of conditions, the response time for the Beeson Crossroads station often exceeds eight minutes and is above the national six minute average (N. Kelker, Personal Communication, October 25, 2010). The home territory contains a Dell manufacturing plant and an expanding business park. The businesses located in this area are crucial in local job development and require fast and consistent fire response. To reach the business park now, Engine Company 19 must travel across the entire home territory; i.e., run times indicate that the best response time the engine company could ever expect from the current location at Beeson Crossroads would be 6 minutes, under optimal conditions.

In addition to the above considerations, there are logistical issues with the Beeson Crossroads facility which affect the firefighters directly. The station has four racks for four Winston-Salem Fire Department firefighters and one to two Beeson volunteer firefighters. This current housing scenario requires that one to two firefighters are "hot-racking"; i.e., one firefighter rolls out of the rack while another one rolls in. Furthermore, there are no separate sleeping or bathing facilities for female firefighters at the Beeson Crossroads facility, which limits the department's ability to assign firefighters. Finally, there aren't enough lockers for the firefighters in the station and there is limited space for performing routine daily activities and training.

Any solution to the above-described issues will require capital investment at the city, county, state, and/or federal level. The City of Winston-Salem began feeling the effects of the economic recession in late 2008. City leaders took immediate emergency steps (i.e., freezing positions/new hiring and delaying nearly all planned equipment purchases) to set aside \$2.6 million from the budget to meet state-mandated cash requirements. The annual budget for the City of Winston-Salem was recently reduced by \$25 million. Even with hard reductions in every department, the city administration was forced to reduce the workforce by 25 positions, cut all merit pay increases, and make previous department budget cuts permanent. In addition, certain city objectives have been placed on hold, such as: (1) replacing an aging vehicle fleet; (2) maintaining employee compensation and competitive salaries; and (3) funding the maintenance of the existing infrastructure, including streets and buildings that have been previously deferred due to lack of revenues. The Winston-Salem Fire Department took a cut of approximately \$500,000 in its operational budget. Finally, the city's tax base growth is presently only 1%, which diminishes funding opportunities for solving shortfalls in service at fire stations/engine companies, such as Engine Company 19 (N. Kelker, Personal Communication, October 25, 2010).

In addition to the above financial issues, many state-collected local revenues are distributed by the State of North Carolina. The state administration, however, has indicated that they may keep all or a portion of these revenues in order to balance the state budget. At a minimum, the City of Winston-Salem stands to lose \$12 million and could possibly lose as much as \$50 million (N. Kelker, Personal Communication, October 25, 2010). While the City of Winston-Salem has balanced their budget, how the state balances its budget may result in more cuts by the city, which in turn can affect capital investments at fire stations/engine companies, including Engine Company 19.

To summarize, the action proposed herein is necessary to: (1) satisfy the need for adequate fire service facilities in the home territory; (2) provide the necessary around-the-clock emergency response to business, residences, and industry located in the home territory; and (3) insure the safety and well-being of the firefighters as well as the home territory inhabitants. The information presented herein for Section 2.2 was prepared from a review of various project-related documents provided to MACTEC by the Winston-Salem Fire Department and the City of Winston-Salem Engineering Division.

3.0 ALTERNATIVES ANALYSIS

NEPA requires the investigation and evaluation of reasonable project alternatives, including impacts to the natural and human environment as part of the planning process.

The major overall deficiency of the existing fire station at Beeson Crossroads is location. A station for Engine Company 19 located inside the 8-square mile home territory would allow the City of Winston-Salem and the Winston-Salem Fire Department to serve its citizens better and accommodate an expected increase in service demand. Therefore, the decision was made by the City of Winston-Salem in 2006, after the final annexation of properties, to construct a new Fire Station 19 facility within the home territory. A formal site survey was then conducted by Fire Suppression and City Real Estate (with coordination from Fire Administration) to determine the actual (preferred) location for the new facility. The formal site survey included: (1) a population density study; (2) a review of existing businesses within the home territory; (3) an examination of the age of existing buildings and type of construction; (4) a 4-minute response time survey; (5) a review of information on proximity to other fire stations; (6) an assessment of road/highway access; (7) a compilation of hydrant locations; (8) a determination of International Organization for Standardization requirements; and (9) a review of potential target areas through the examination and comparison of land purchasing opportunities, zoning allowances, variances, exemptions, and restrictions, and regulatory permitting requirements. The formal site survey was conducted for the period between December 2006 and August 2008. The number of personnel and trucks to be assigned to the new station were determined by examining data relevant to Engine Company 19 calls, projected expansion of inhabitants and buildings within the home territory, traffic patterns (current and anticipated), and fire department standards. A determination was also made that the new fire station would initially be manned by a one engine company, with a truck company to be added as the territory's population and demand increased.

The Winston-Salem Fire Department has signed a mutual aid agreement with Forsyth County and every town and village within the county. The Winston-Salem Fire Department is also bound by the North Carolina State Emergency Management Mutual Aid Agreement. As the fourth largest city in the state and the largest fire department in Forsyth County, the Winston-Salem Fire Department is often called upon to provide resources that are often not available elsewhere. The aforementioned formal site survey for the new fire station accounts for traffic patterns in selecting a central location near the interstate and access roads to the fire department's Mutual Aid partners on the southeast side of Winston-Salem. The Mutual Aid partners include the City of High Point, the Town of Kernersville, and two volunteer fire department territories along the southeast corner of Forsyth County. The new fire station would also be able to render mutual aid to the City of Greensboro.

Note: According to the Forsyth County Geo-Data Explorer, the location of the existing fire station at Beeson Crossroads is mapped as Zone X, an area that is outside the 100- and 500-year floodplains (Forsyth County 2010a).

The alternatives analysis discussion for the Fire Station 19 project includes the Proposed Action, the No Action Alternative, and Alternative Actions Dismissed (i.e., alternatives that were rejected from further consideration).

3.1 No Action Alternative

The no action alternative would result in no construction of a new fire station within the home territory. Engine Company 19 would continue to conduct its operations from the Beeson Crossroads Volunteer Fire Department facility. This location, at 1105 Old Salem Road, Kernersville, North Carolina 27284, exists outside the home territory of Engine Company 19; therefore, response times for the engine company would remain as they currently exist. Response times are expected to further increase with the predicted population growth and increased call volume in the home territory. The no action alternative essentially results in a lower level of overall public safety and firefighter safety than the proposed action.

3.2 Proposed Action Alternative

Based on the results of the above investigations, the Winston-Salem Fire Department determined that, in order to satisfy response times, provide service to newly annexed areas, and meet future needs of the home territory, the new fire station would need to be located on a one mile section of Glenn Hi Road, between Union Cross Road and Oak Grove Church Road. In addition to response times, a number of other factors were considered in the final selection process, including access to sewer, vehicle accessibility, and the purchase price of the site while factoring in the possible damages to the remainder of the parcel if it were subdivided from a larger parcel. After all of the above factors were weighed and considered, the Fire Department, Engineering Department, Facilities Maintenance Department, Real Estate Department, and independent consultants recommended, as the preferred new station location, a 1.22-acre site at the intersection of Glenn Hi Road and Crossfield Drive (**Figure 1** and **Figure 2**). The Winston-Salem Fire Department purchased the selected property in October of 2008.

The proposed action will result in the construction of a 9,090 square foot, two bays, one story, metal building with block and brick veneer on the aforementioned 1.22-acre site. The new fire station would house nine to ten firefighters per shift on a 24/7 basis who provide fire, rescue, and medical response service. The sleeping quarters, bathroom, and shower facilities would be designed to house both male and female firefighters with sleeping space for nine individuals per shift. **Figure 3** is the proposed site development plan for the Fire Station 19 project.

The major operational benefit for the Winston-Salem Fire Department will be the location of the new fire station in the engine company's home territory instead of in another town. Response times will be much lower, which will reduce wear and tear on both vehicles and firefighters and allow the fire department to better serve the public. At the Beeson Crossroads location, Engine Company 19 currently meets the five minute response time only 56% of the time (N. Kelker, Personal Communication, October 25, 2010). At the new facility location, Engine Company 19 is projected to meet this goal 96% of the time. It is also projected that Engine Company 19 will be able to meet the city's goal of a 4 minute response 80% of the time. Other benefits of the proposed action will include improved sleeping space for firefighters, additional space for equipment maintenance, and the elimination of scheduling conflicts for training and other activities (i.e., as a benefit of the separation of Engine Company 19 from the Beeson Crossroads Volunteer Fire Department facility). The new location for Engine Company 19 will facilitate the company's ability to be available as a second or third responding unit to other territories, which will relieve the burden on other fire stations. Finally, fire prevention services, including safety inspections, community education, and safety programs, will be improved, as these services will be delivered to the community more often and by an engine company that resides within the home territory. Face to face interaction between the firefighters and the public is very important.

To summarize, the daily operations for Engine Company 19 and the Winston-Salem Fire Department as a whole would be positively affected by the construction of a new fire station within the home territory, thereby meeting the above described project needs. The proposed action would have a direct and immediate effect on protecting the lives and property of the community within the home territory because of the enhanced response capabilities. The reduced response times would decrease the overall time spent on each response and reduce the risks to firefighters' health and safety. Faster response would allow the firefighters to spend "saved" time on recovery and other operational concerns. The new fire station would also make responses to mutual aid calls much faster and free up companies that are currently required as 2nd and 3rd in units due to Engine Company 19 response problems from the Beeson Crossroads location. Finally, with a new construction that adds to the number of fire stations, firefighters would have to be hired, vehicles would need to be funded, and equipment would need to be purchased. However, under the proposed action, the Winston-Salem Fire Department will be able to immediately occupy and equip the new station with Engine Company 19 without additional procurement and without sacrificing any fire suppression responsibilities. The information presented herein for Section 3.1 was prepared from a review of various project-related documents provided to MACTEC by the Winston-Salem Fire

Department.

3.3 Alternative Actions Considered and Dismissed

As discussed in Section 2.2, Engine Company 19 is currently housed in the Beeson Crossroads Volunteer Fire Department building, which is located in a neighboring town. At the Beeson Crossroads location, Engine Company 19 exists outside of its home territory and the city limits of Winston-Salem. This housing arrangement has burdened the day-to-day operations and response service capabilities of Engine Company 19. This situation also prevents the Winston-Salem Fire Department from providing the same level of service that the department offers in other station territories. Other alternatives for improving fire and rescue response in the home territory were considered and dismissed, as discussed below.

One alternative to improve emergency response time within the home territory is to hire additional firefighters and purchase a new ladder fire truck. However, because the Beeson Crossroads Volunteer Fire Department facility is essentially not equipped to accommodate more firefighters or an additional truck (i.e., Engine Company 19 currently shares sleeping quarters, kitchen, and training space with the volunteer fire department), this alternative would clearly not be feasible or meet project needs. Furthermore, response times would not improve as the departure location for emergency vehicles from Engine Company 19 would be unchanged.

A variation of the above alternative is to hire additional firefighters and purchase a truck, but require that these firefighters live in close proximity to the Beeson Crossroads Volunteer Fire Department facility as the facility is not equipped to accommodate more firefighters and trucks. These additional firefighters would respond from their homes to the Beeson Crossroads facility and then to the emergency incident. This alternative is neither practical nor feasible, as there is no guarantee that the new hires would remain at their properties for the duration of their employment. The ethical consequences that are associated with requiring new staff to live within close proximity to the volunteer fire station must also be considered. Finally, response times would not improve as the departure location for emergency vehicles from Engine Company 19 (i.e., Beeson Crossroads) would be unchanged. This alternative was dismissed as also not meeting project needs, as it does not constitute a long-term, sustainable approach to improving fire and rescue response within the home territory.

Other alternatives, such as installing an additional modular building at the Beeson Crossroads location rather than constructing a new facility within the home territory as proposed in Section 3.1, would not improve the current situation. While the installation of a single-story modular structure would improve the current housing arrangements for firefighters from Engine Company 19 by providing space for equipment storage, workstations, training areas, sleeping, and cooking/dining, the response times from the Beeson Crossroads location would not be improved. For this singular reason, the alternative of installing an additional modular structure at the existing station location was determined to be an unrealistic alternative to improving fire and rescue response within the home territory and was therefore dismissed.

4.0 AFFECTED ENVIRONMENT AND POTENTIAL IMPACTS

This section of the EA describes the environmental components and other site specific characteristics of the project and the property and the potential consequences of the proposed action on these components and characteristics. The proposed action is also evaluated against existing environmental documentation and anticipated future projects to determine the potential for cumulative impacts. Included in each section, where applicable, is a discussion of measures to mitigate impacts. Estimated impacts were determined utilizing an overlay of the proposed project development elements on site-specific, spatial, review data. Finally, the potential for significant site consequences is evaluated herein pursuant to the 'context' and 'intensity' considerations described in the CEQ regulations for implementing the procedural provisions of NEPA (40 CFR 1508.27).

Table 1 summarizes the potential impacts of the proposed action and the mitigative measures to reduce the impacts, where appropriate or necessary, for the Fire Station 19 project.

Table 1. Affected Environment and Impacts Summary, Proposed Action, Fire Station 19 Project Site, Winston-Salem, North Carolina.

Affected Environment	Impacts	Mitigation
Geology and Soils	The proposed action would disturb shallow soils and surficial geology during site preparation work.	Erosion and sedimentation control Best Management Practices will be implemented to prevent construction-related impacts to on site and off site soils.
Air Quality	Air emissions would likely occur during construction of the proposed action. Such emissions would likely have minor and temporary effects on air quality during equipment use (vehicle exhaust) and soil grading activities (fugitive dust). In the post-construction condition, the diesel exhaust system from the fire truck could have a long term impact.	The contractor will minimize air pollution throughout construction activities through dust suppression, minimizing running times of fuel burning equipment, and proper engine maintenance. Post-construction, the new fire station will include a vehicle exhaust removal system in the bays to capture and clean particulates and gases from the trucks.
Waters of the U.S.	No waters of the U.S., including wetlands, were identified on site; therefore no Section 404 Clean Water Act permit will be required. No impacts to waters of the U.S. will occur under the proposed action.	Not applicable
Floodplains	The proposed action is located in Zone "X", an area outside a mapped floodplain, as shown on Federal Emergency Management Agency - Flood Insurance Rate Map Panel No. 6864 (Map No. 3710686400J). No impacts to floodplains will occur under the proposed action.	Not applicable
Water Quality	Sediment-laden runoff from the construction area has the potential to adversely affect the quality of stormwater from the project site.	Water quality impacts will be avoided and minimized through stormwater management design and implementation of Best Management Practices.
Protected Plant and Animal Species	No federally protected (listed), threatened or endangered, plant or animal species were observed or detected on the project site; therefore, Endangered Species Act - Section 7 consultation is not required.	Not applicable
Cultural and Historic Resources	Coordination with the North Carolina State Historic Preservation Office concluded that the proposed action would have no affect on cultural and historic resources.	Not applicable

Affected Environment	Impacts	Mitigation
Socioeconomic Resources	The proposed action will improve public safety by increasing fire and rescue protection and improving emergency response times. The project has been sited in an area recently annexed for residential use. The utility systems can accommodate the project. In the post-construction condition, impact to the public could occur from fire trucks during emergency response events.	Significant impacts to socioeconomic resources are not anticipated. The proposed action would have a direct and immediate effect on protecting the lives and property of the community within the home territory because of the enhanced response capabilities. With regard to public safety, traffic impacts during emergency response events will be minimized through the application of safe driving practices by fire department responders.
Environmental Justice (Executive Order 12898)	The City of Winston-Salem is committed to protecting the lives and property of all citizens equally, regardless of socioeconomic status or race. Therefore, all socioeconomic classes stand to benefit from the proposed action and no adverse impacts will occur.	Not Applicable
Noise	Temporary short-term noise impacts are anticipated during the construction period for the proposed action. Intermittent elevated noise would be sustained for extremely short durations during emergency response events.	To reduce noise levels, construction activities will take place during normal daylight business hours. Post-construction impacts cannot be entirely mitigated due to National Fire Protection Agency 1901 and State Fire Marshal requirements for minimum sound-warning requirements for fire equipment when responding to an emergency. To reduce impacts, such alarms will only sound when necessary for response and testing. Additionally, because of the residential location, the fire department endeavors not to use sirens at the station, and instead activates them once the truck is rolling down the street. This action minimizes noise impact on immediate neighbors.
Air	Construction of the proposed action would require use of various pieces of heavy equipment, which can affect air quality through vehicle emissions and fugitive dust. Such impacts will be minimal, short in duration, temporary, and of local influence only, however.	Construction Best Management Practices will be implemented to control dust.
Cumulative Impacts	The proposed action is consistent with foreseeable future action within the home territory; therefore, no adverse cumulative impacts are anticipated.	Environmental diligence in construction standards, planning, and design for the project will be maintained to avoid and minimize cumulative impacts.

4.1 Physical Resources

No Action Alternative

Under the no-action alternative, no construction activities would take place; therefore, there would be no impacts to geology, soils, forest resources, air quality or climate change.

Proposed Action Alternative

4.1.1 Site Location

The Fire Station 19 project site is located within a recently annexed area of the City of Winston-Salem, at the intersection of Glenn Hi Road and Crossfield Drive (Latitude 36.069425/Longitude -80.122019) (**Figure 1 and Figure 2**). The physical address of the project site is 4430 Glenn Hi Road, Winston-Salem, North Carolina. The project site is comprised of two parcels and encompasses 1.22 acres of open undeveloped land in the southeastern part of the city. The northern and western boundaries of the site abut Glenn Hi Road and Crossfield Drive, respectively. A rural single-family residence borders the eastern boundary of the site, while open undeveloped land exists to the south. **Figure 4** (ground level photography) depicts the current site conditions that occur within the property.

4.1.2 Geology and Soils

The Fire Station 19 project site is located in the Southern Outer Piedmont (Level IV) Ecoregion of North Carolina (NRCS 2000). The topography of the overall project area is relatively flat and gently slopes to the south. Elevations range from approximately 950 feet National Geodetic Vertical Datum (NGVD) in the vicinity of the northern property boundary to approximately 940 feet NGVD along the southern property boundary. The United States Geological Survey (USGS) 7.5 minute topographic quadrangles of the project site vicinity (i.e., *Kernersville, NC* and *Winston-Salem East, NC*) are presented on Figure 5.

With regard to the geologic setting, the project site is located in the Charlotte Belt of the Piedmont Physiographic Province of North Carolina (NCGS 1985). The Charlotte Belt is underlain by megacrystic to equigranular granitic rock. In the Piedmont Physiographic Province, crystalline bedrock is overlain by unconsolidated material, called regolith. The regolith can range in thickness from 0 to approximately 200 feet.

The soils on the project site, as mapped by the United States Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS), encompass the following map units: Clifford clay loam, 2 to 6 percent slopes, moderately eroded (CmB2) and Clifford clay loam, 6 to 10 percent slopes, moderately eroded (CmC2) (**Figure 6**) (NRCS 2009). The CmB2 map unit encompasses more than 95 percent of the of the project site. Clifford soils are moderately eroded, very deep, well-drained soils found on hills in the Piedmont. The depth to the water table in the moderately permeable soil is approximately 80 inches. The major land uses include cultivated crops, pasture, and forest. According to the NRCS, the CmB2 and CmC2 map units are not considered to be hydric soils (hydric map units) (NRCS 2010). A geotechnical evaluation of the site was completed, which determined the site was suitable for construction if site work recommendations were followed (S&ME 2009).

Site grading and construction activities will occur across the majority of the project area under the proposed action. The construction will disturb shallow soils and surficial geology during site preparation work. However, as the project site is relatively flat, grading will be limited and the effects to geology and soils in the region would be imperceptible. The construction will also alter the existing topography within the footprint of the project. Soil removed from the excavation may be used to raise the grade of portions of the project where a change in elevation is necessary. The potential change in elevation across the project area is relatively slight, however.

Work on-site will be conducted using large earth-moving equipment. The use of diesel-fueled equipment creates a potential for soil contamination resulting from equipment leaks or spills from fueling operations. Possible soil contaminants include diesel fuel, hydraulic and lubricating oils, and grease. Proper

equipment maintenance and secondary containment around fuel skids will reduce the potential for releases or spills to reach surface soils. Furthermore, erosion and sedimentation control Best Management Practices (BMPs) will be implemented in accordance with state and federal requirements to prevent construction-related impacts to on-site and off-site soils and water quality.

4.1.3 Prime Farmland

As defined in the Farmland Protection Policy Act (FPPA) of 1981, prime farmland is land that has the best combination of physical and chemical characteristics for producing food, feed, fiber, forage, oilseed, and other agricultural crops with minimum inputs of fuel, fertilizer, pesticides, and labor. The proposed action was reviewed for potential impacts on prime farmlands in accordance with Section 1541 of the FPPA (FPPA 1982). The project site is presently zoned 'Residential Single Family.' The USDA excludes projects on land already in urban development or used for water storage from provisions under FPPA per *Title 7 Part 658.2*. Therefore, the proposed action will not impact prime (or unique) farmland.

4.1.4 Forest Resources

No trees or shrubs occur on the Fire Station 19 project site. The proposed action will not impact merchantable forest resources; as such resources are not present on the project site.

4.1.5 Air Quality

Air quality at the proposed Fire Station 19 location is typical of general suburban areas within the City of Winston-Salem jurisdiction. Current sources of air emissions include automobiles and heating and cooling units of nearby single family residences. The Environmental Protection Agency (EPA) has designated Forsyth County, as well as the entire state of North Carolina, as "unclassifiable/attainment" for ozone and other pollutants (EPA 2010).

Minor new traffic will be generated by employees of and visitors to the proposed Fire Station 19 facility. There will be approximately fifteen parking spaces constructed at the project site. Roads, parking lots, parking decks, shopping centers, malls, and airports are considered transportation facilities. The construction or modification of a transportation facility may result in carbon monoxide levels above the National Ambient Air Quality Standard (NAAQS). Therefore, a construction permit is required for a new or expanded transportation facility if the facility exceeds the following NAAQS threshold requirements:

- Highway projects with a projected traffic volume of 2,000 vehicles per hour or more within 10 years;
- Airport facilities designed for at least 100,000 annual aircraft hours of operation or at least 45 landing and takeoff cycles in any one hour;
- Parking facilities with a capacity of 1,500 spaces or open parking area of 450,000 square feet or expansion of such a facility by 500 spaces;
- Parking decks or garages with capacity of at least 750 spaces or a potential parking area of at least 225,000 square feet or expansion of such a facility by 250 spaces; or
- A combination of decks, lots, and garages with capacity of at least 1,000 spaces or a potential parking area of at least 300,000 square feet, or expansion of such a facility by at least 500 spaces.

Based on the description of the proposed Fire Station 19 facility and the fact that the project elements, inclusive of the fire station parking lot and engine garage, will not exceed the aforementioned threshold requirements, a construction permit (i.e., for a new or expanded transportation facility) is not presumed to be required.

As mandated by the North Carolina Department of Environment and Natural Resources (NCDENR), any open burning associated with the project must be in compliance with North Carolina Administrative Code (NCAC) Section 15A NCAC 2D.1900. Burning of construction debris will be prohibited, however, to minimize the risk of escaped wildfire and to avoid the generation of air pollutants associated with this activity. The Winston-Salem Fire Marshal's office has stated that permits would not be issued for this

type of burning; i.e., the construction debris must be hauled away (N. Kelker, Personal Communication, November 3, 2010).

As a construction project, the proposed action will require earth moving procedures, such as excavation, cutting, filling, and placing soil and/or engineered fill. These procedures could create fugitive dust. Construction BMPs would be used to minimize dust build-up. Construction would require use of various pieces of heavy equipment, such as haul trucks, backhoes, bulldozers, and scrapers. Any effects to air quality will be the result of construction activity. Such impacts, however, will be minimal, short in duration, temporary, and of local influence only. Emissions would most likely originate with vehicle emissions and fugitive dust. Implementing construction BMPs to control dust will mitigate this concern. Although the emissions would be temporarily increased, no long-term air quality degradation is presumed. Furthermore, the emissions would effectively cease upon completion of the construction project.

In the post-construction condition, the diesel exhaust system from the fire truck could have a long term impact on air quality. However, as a mitigative measure, the new fire station will include a vehicle exhaust removal system in the bays to capture and clean particulates and gases from the trucks.

To conclude, impacts to air quality under the proposed action are expected to be minor and/or temporary.

4.1.6 Climate Change

The CEQ has recently released guidance on how Federal agencies should consider climate change in their action decision-making. The suggested threshold whereby quantitative analysis should be done in NEPA documents is for an action to release over 25,000 metric tons of greenhouse gases per year (CEQ 2010). Given the nature and small scale of the Proposed Action, and expected negligible greenhouse gas releases both during construction and operation, no detailed analysis was completed because it would not meet the above threshold.

4.2 Water Resources

No Action Alternative

Under the no-action alternative, no construction activities would take place; therefore, there would be no impacts to waters of the U.S., including wetlands, or water quality. There would be no impacts from floodplains because the site is neither located in a 100- or 500-year floodplain (FEMA 2010).

Proposed Action Alternative

4.2.1 Waters of the U.S.

Jurisdictional waters of the U.S., including perennial and intermittent streams, wetlands, and other special aquatic sites, are defined by 33 CFR Part 328.3 et al. and are protected by Section 404 and other applicable sections of the Clean Water Act (e.g., 33 United States Code [USC] 1344 et al.), which is administered and enforced by the United States Army Corps of Engineers (USACE) as well as other federal and state government agencies. Executive Order 11990, Protection of Wetlands, requires federal agencies to take action to minimize the destruction or modification of wetlands, by considering both direct and indirect impacts to wetlands that may result from federally funded actions.

Wetlands and other surface waters, for this investigation, are those areas which satisfy the technical criteria in the 1987 *Corps of Engineers Wetlands Delineation Manual* (Environmental Laboratory 1987). The field investigation included an inspection of the Fire Station 19 project site to identify areas which exhibited wetland or surface water criteria. The criteria for wetland determination were based on the identification of three principal parameters in accordance with the USACE delineation manual: i.e., the prevalence of hydrophytic vegetation, the presence of hydrology, and the presence of hydric soils. The methods for determination of stream classification were in general accordance with the NCDENR Division of Water Quality (DWQ) stream evaluation protocols presented in *Methodology for*

Identification of Intermittent and Perennial Streams and their Origins (Version 4.1), dated September 1, 2010 (DWQ 2010a). The field investigation was conducted on September 14, 2010.

A selection of maps and other resources, including United States Fish and Wildlife Service (USFWS) National Wetlands Inventory (NWI) map, NRCS soil survey map, NRCS hydric soil list, USGS topographic quadrangle map, and aerial photography, were used to facilitate the determination of potential jurisdictional waters of the U.S., including wetlands, on the project site.

Based on the results of the September 14, 2010 field investigation and the examination of the aforementioned maps and other resource material, no potentially jurisdictional wetlands or other surface waters, including lakes, ponds, and streams, or isolated wetlands subject to State of North Carolina regulatory protection, were found or characterized on the project site. This finding is corroborated by the absence of hydric map units within the project site (see Section 4.1.2). Furthermore, the USFWS NWI map reveals no mapped jurisdictional surface waters on the project site (**Figure 7**) (USFWS 2010a). The proposed action will not impact any waters of the U.S., including wetlands, as such features are absent from the project site. No review or concurrence (i.e., through a Notification of Jurisdictional Determination) by the USACE is necessary for the proposed action, as no waters of the U.S. are present on the project site.

Waters of the U.S. (ponds and perennial streams) are present approximately 1,500 feet to the south of the project site. These surface waters drain to the west to Swaim Creek. BMPs will be utilized at the project site to control sediment-laden runoff during construction and reduce the potential for water quality impacts to the Swaim Creek watershed.

4.2.2 Floodplains

Executive Order 11988, Floodplain Management, requires federal agencies to minimize occupancy and modifications of floodplains. Furthermore, Executive Order 11988 specifically prohibits federal agencies from funding construction in 100-year floodplain (or 500-year floodplain for critical facility) unless there are no practical alternatives.

The FEMA Flood Insurance Rate Map (FIRM) Panel No. 6864 (Map No. 3710686400J, effective date January 2, 2009) depicts no flood zones for the Fire Station 19 project site (**Figure 8**) (FEMA 2010b). The Fire Station 19 project site is mapped as Zone X, an area that is determined to be outside the 100- and 500-year floodplains (i.e., an area outside the 0.2% annual chance floodplain). Therefore, the proposed action will not result in floodplain impacts.

4.2.3 Water Quality (Surface Water / Groundwater)

The Fire Station 19 project site is located within the Yadkin-Pee Dee River Basin (DWQ 2010b). The Yadkin-Pee Dee River headwaters, which are partially in the Blue Ridge region, are located in northwestern North Carolina and extreme southern Virginia. Water flows southeast across the Piedmont and through North Carolina's densely populated midsection, then moves through a portion of the Coastal Plain region before entering South Carolina. The river basin drains 7,221 square miles. Major tributaries in the Yadkin-Pee Dee River Basin are the South Yadkin, Uwharrie River, and Rocky River. Predominant threats to this river basin include degraded water quality from increased urbanization and loss of riverine habitat due to dam construction. The project site is also located within the USGS 8-Digit Cataloging Unit 03040101 (USGS 2010). The nearest named tributary to the project site is Swaim Creek. Swaim Creek drains to South Fork Muddy Creek, which in turn flows into the Yadkin River. Tributaries of the Yadkin River, which may be subject to county or local municipal riparian buffer rules, are not present on the project site.

The project site is located within the Piedmont Physiographic Province of North Carolina. In the Piedmont, crystalline bedrock is overlain by unconsolidated material, called regolith. The regolith can range in thickness from 0 to approximately 200 feet. Groundwater is stored within the pore spaces

between unconsolidated materials and in fractures within the crystalline bedrock. Typically, the regolith acts as a reservoir for groundwater, transmitting water to the fractured bedrock system. Most water-supply wells are cased through the regolith and into bedrock. These wells are usually completed as open-hole wells within the bedrock, with groundwater being transmitted into the well through the fractures within the crystalline bedrock. Current well regulations require that the casing extend at least one foot into consolidated rock. The project site provides no potable water to the developed properties adjacent to the site.

With regard to development and the opportunity for impact to water quality, sediment-laden runoff from the construction area has the potential to adversely affect the quality of stormwater from the project site. Exposed soil within the active construction site can be transported via overland stormwater runoff and deposited within the local stormwater management system (SWMS). Stormwater from the SWMS discharges to streams and wetlands within the Yadkin-Pee Dee River Basin. Sediment-laden runoff can cause the system to lose capacity and functionality, thereby impacting vegetation and wildlife within the river basin. The implementation of the Erosion and Sedimentation Control Plan (ESCP) is expected to minimize the potential for sedimentation of streams and wetlands within the Yadkin-Pee Dee River Basin during and immediately following the construction of the proposed project. The ESCP will include inspections of erosion and sediment control devices for compliance with the construction contract documents during and after construction, as well as following major storm events, to identify needed repair, maintenance, or redesign.

Surface water and groundwater quality impacts related to site development will be avoided and minimized through stormwater management engineering. The stormwater management design for the Fire Station 19 project site has been reviewed by the City of Winston-Salem Stormwater Division as part of the local regulatory permitting process. Approval of the stormwater management plan was granted by the City of Winston-Salem Stormwater Division on September 11, 2009. The implementation and proper maintenance of the approved ESCP, pursuant to the Sedimentation and Erosion Control Act of 1973, will be used to effectively minimize the potential for long-term as well as short-term construction-related impacts to drainage systems or water quality in the area. The plan will employ a network of sediment traps, diversion ditches and/or silt fences during construction to prevent the export of sediment from the project site to adjacent undisturbed areas. The proposed project required a National Pollutant Discharge Elimination System (NPDES) construction permit, which will require implementation of appropriate pollution prevention techniques to minimize erosion and sedimentation and properly manage stormwater. A sand filter system has been designed to State Standards and has been approved by the City of Winston-Salem on September 11, 2009. With these actions, surface water and groundwater quality impacts related to development of the project will be avoided and minimized through stormwater management engineering and implementation of sediment and erosion control BMPs. Finally, the Winston-Salem/Forsyth County Utilities Division will provide potable water to the Fire Station 19 facility post-development. With these considerations, the proposed action will not result in adverse water quality impacts.

4.2.4 Coastal Waters

The Fire Station 19 project site does not encompass coastal waters, including anadromous waterways. Furthermore, the subject property does not occur within any of the 20 counties which comprise the area of jurisdiction under the NCDENR Division of Coastal Management, as pursuant to State of North Carolina Coastal Area Management Act rules. Finally, federal consistency under the Coastal Zone Management Act of 1972 will not be required, as the proposed action will not entail work in the coastal zone.

4.3 Biological Resources

Native or naturalized vegetation, wildlife, and the habitats in which they occur are collectively referred to as biological resources. Section 7 of the Endangered Species Act (ESA) requires federal agencies to ensure that any actions authorized, funded, or carried out by those agencies are not likely to jeopardize the

continued existence of listed (protected) species of flora and fauna or modify their critical habitat.

No Action Alternative

Under the no-action alternative, no construction activities would take place; therefore, there would be no impacts to biological resources, federally listed, threatened or endangered, animal or plant species.

Proposed Action Alternative

4.3.1 Wildlife and Natural Vegetation

Certain plant and animal species are protected by federal and/or state regulations [Federal ESA of 1973 (16 USC 1531-1544, December 28, 1973, as amended 1976-1982, 1984, and 1988), the North Carolina Endangered Species Act (N.C.G.S. Section 113 Article 25), and the North Carolina Plant Protection and Conservation Act of 1979 (General Statutes 19b106:202.12-22)]. Furthermore, pursuant to the Fish and Wildlife Coordination Act (Title XVI, Chapter 5A, Subchapter I, Sections 1539-1549 of the USC), as amended in 1964, the effect of the proposed project on fish and wildlife must be considered. The Fish and Wildlife Coordination Act also requires that actions be taken to prevent loss or damage to natural streams or bodies of water as a result of project activities.

MACTEC conducted a literature and records search and an on-site habitat assessment, as consisting of a pedestrian survey of suitable habitat (September 14, 2010), to characterize the natural plant communities and determine the likelihood of occurrence of protected (listed) plant and animal species within the Fire Station 19 project site. Presence or absence of protected species was confirmed through direct observation or sign (e.g., sighting, tracks, scat, nests, dens, or call). The Fire Station 19 project site is singularly comprised of old field habitat. **Figure 4** (ground level photography) depicts the current site conditions that occur within the property. No other upland vegetative communities or land use occupy the site. No surface waters, as including wetlands, ponds, perennial/intermittent streams or ephemeral drainage features, are present. The native vegetation includes common grasses and forbs, such as Persian clover (*Trifolium resupinatum*), common dandelion (*Taraxacum officinale*), wild potato-vine (*Ipomea pandurata*), spreading dogbane (*Apocynum androsaemifolium*), plantain (*Plantago* sp.), foxtail grass (*Setaria geniculata*), panic grass (*Panicum* sp.), and fescue grass (*Festuca* sp.).

Table 2 presents information on the potential (likelihood) for listed species of animals and plants to occur within the Fire Station 19 project site, for species known to presently occur, or historically have occurred, in Forsyth County, North Carolina. The likelihood of occurrence, as listed within this table, is based on a comparison of the known habitat use by these species and the habitats found within the project site and the quantity, quality, and proximity of these habitats, as well as any observations of these species during field reconnaissance. The likelihood of occurrence for listed species was rated as high, moderate, low, or unlikely based on knowledge of a species' habitat preference and site conditions and whether or not the species was observed during site reconnaissance. A likelihood of occurrence given as "unlikely" indicates that no suitable habitat, or extremely limited habitat, for the species exists on site. The USFWS protected species database, last updated in January 2008, recognizes the federally listed species in Forsyth County that are presented in Table 2. The NCDENR Natural Heritage Program (NHP) database of known protected species populations and elements of occurrence includes state listed species in Forsyth County, as well as federally listed species (Table 2) (NHP 2010, USFWS 2010b).

Table 2. Potential for Occurrence of State and Federally Listed Animal and Plant Species on the Fire Station 19 Project Site, Winston-Salem, North Carolina.

Common Name (Scientific Name)	Federal Status	State Status	General Habitat Description	Potential for Occurrence
FAUNA				
Brook Floater (mussel) (<i>Alasmidonta varicosa</i>)	FSC	E	High relief streams among boulders in sand. Piedmont systems and along Blue Ridge escarpment of Catawba River system.	Unlikely
Creeper (mussel) (<i>Strophitus undulatus</i>)	--	T	Shallow water in both small streams and large rivers. Inhabits a variety of substrates, from silt to boulder fields. Tar, Neuse, Cape Fear, Pee Dee, and French Broad systems, and potentially other river systems in Piedmont.	Unlikely
Bigeye Jumprock (fish) (<i>Moxostoma ariommum</i>)	--	T	Warm streams of moderate gradient; slightly to heavily silted and vary in clarity; deep runs and well-flowing parts of pools. Dan River drainage.	Unlikely
Bog Turtle (<i>Glyptemys muhlenbergii</i>)	T(S/A)	T	Prefer bogs, fens, marshy meadows, wet pastures, wet thickets, and other wetlands with emergent vegetation, primarily in the mountains. Spring seepages and associated mucky soils are often utilized.	Unlikely
Red-cockaded Woodpecker (<i>Picoides borealis</i>)	E	E	Mature open pine forests; mainly in longleaf pine (<i>Pinus palustris</i>), typically with red-heart disease for cavity nesting. Per the NHP, the element has not been seen recently in Forsyth County (Historic Record*).	Unlikely
FLORA				
Bog Rose (<i>Arethusa bulbosa</i>)	--	S	Bogs. Per the NHP, the element has not been seen recently in Forsyth County (Historic Record).	Unlikely
Small-anthered Bittercress (<i>Cardamine micranthera</i>)	E	E	Seeps, streamside sandbars, and floodplain depressions. Per the NHP, the element has not been seen recently in Forsyth County (Historic Record).	Unlikely
Yellow Fringeless Orchid (<i>Platanthera integra</i>)	--	T	Savannas and grasslands. Per the NHP, the element has not been seen recently in Forsyth County (Historic Record).	Low
Small's Portulaca (<i>Portulaca smallii</i>)	--	T	Granite flatrocks and diabase glades. Per the NHP, the element has not been seen recently in Forsyth County (Historic Record).	Unlikely

Sources: North Carolina Natural Heritage Program (North Carolina Department of Environment and Natural Resources, Office of Conservation and Community Affairs); Forsyth County Record Search Results, Website accessed on September 23, 2010. U.S. Fish and Wildlife Service - Endangered and Threatened Species; Forsyth County Record Search Results, Website accessed on September 23, 2010.

Explanation Codes: E = Endangered; T = Threatened; T(S/A) = Threatened due to Similarity of Appearance; FSC = Federal Species of Concern.

* = Historic Record – The species was last observed in the county more than 20 to 40 years ago (range).

No state or federally listed, threatened or endangered, animal or plant species were observed during the field investigation. The quality of the existing habitat within the project site is presumed to be significantly less than optimal for listed animal species with a potential for occurrence in Forsyth County. The primary contributing factor for this determination is the historic agricultural land use of the area. Common wildlife species are expected to utilize the project site rather than listed species. The likelihood of occurrence of listed plant species within the project site is also considered to be unlikely, due to the historic agricultural land use.

The NHP, operated by the NCDENR Office of Conservation and Community Affairs, was consulted via letter dated September 15, 2010 for information on known occurrences of federally and state listed species and critical habitats, with regard to the potential impact(s) to the terrestrial and aquatic ecosystems resulting from development of the project. The NHP responded in correspondence dated September 24, 2010 that the “Natural Heritage Program has no record of rare species, significant natural communities, significant natural heritage areas, or conservation/managed areas at the site nor within a mile of the project area.” The USFWS was consulted via letter dated September 15, 2010 and responded on September 23, 2010 stating that “no federally listed species or their habitats occur on the subject site.” The USFWS also stated that “the requirements under section 7 of the Act are fulfilled.” Finally, the USFWS qualified the response by stating that “obligations under section 7 of the Act must be reconsidered if: (1) new information reveals impacts of these identified actions that may affect listed species or critical habitat in a manner not previously considered, (2) these actions are subsequently modified in a manner that was not considered in this review, or (3) a new species is listed or critical habitat is determined that may be affected by the identified actions.” A copy of the correspondence between MACTEC and the NHP and the correspondence between MACTEC and the USFWS is provided as **Appendix A**.

Finally, based on the results of the literature and records search, the on-site habitat assessment, and the concurrence from the NHP and the USFWS, it is presumed that the Fire Station 19 project will have “no effect” (no impact, positive or negative) to listed biological resources; i.e., no listed biological resources will be exposed to the proposed action and its environmental consequences. It is also presumed that the proposed project will have no adverse effect on non listed wildlife species (populations), as suitable habitat for mammalian, avian, and reptile and amphibian generalist species is present on adjoining properties and throughout the region.

4.3.2 Fish and Aquatic Habitat

The Fire Station 19 project site is not within close proximity (i.e., abutting, or at least within 500 feet) of fish and aquatic habitat and does not encompass streams or other surface waters such as lakes and ponds. Furthermore, the project site is located more than 1,500 feet from unnamed tributaries of the Yadkin River. Since the project site does not provide suitable habitat for fish or aquatic macro-invertebrates, the proposed action will not result in impacts to fish and aquatic habitat.

The project site does not encompass coastal waters (marine resources); therefore, no consultation with the National Oceanic and Atmospheric Administration (NOAA) National Marine Fisheries Service (NOAA Fisheries Service) is required.

4.3.3 Critical Habitat

Pursuant to the ESA, the federal government must designate critical habitat for any species it lists under the ESA. Critical habitat is defined as: (1) specific areas within the geographical area occupied by the species at the time of listing, if they contain physical or biological features essential to conservation, and those features may require special management considerations or protection and (2) specific areas outside the geographical area occupied by the species if the agency determines that the area itself is essential for conservation. The Fire Station 19 project site is comprised of old field habitat. The vegetation consists of common forb and grass species. According to the USFWS Red Book, no critical habitat is present within

the project site and no critical habitat abuts the project site (USFWS 1992). As such, the proposed action will not result in impacts to critical habitat.

4.4 Cultural and Historic Resources

The consideration of impacts to cultural resources is mandated under Section 106 of the National Historic Preservation Act (NHPA), as amended in 1992 and implemented by 36 CFR Part 800 (“Protection of Historic Properties”). NHPA regulations require the identification of significant cultural resources that may be impacted by project action alternatives. Cultural resources encompass prehistoric and historic sites, structures, districts, artifacts, or any other physical evidence of human activity considered important to a culture, subculture, or community for scientific, traditional, religious, or other reasons. Cultural resources that are determined to be potentially significant under NHPA are subject to protection from adverse impacts resulting from an undertaking. Furthermore, under the NHPA, as amended, and the Archeological and Historical Preservation Act of 1960, as amended, the Secretary of the Interior has compiled the National Register of Historic Places (NRHP), which contains sites and buildings of significant importance to the United States. If a designated historic property will be affected by construction activities, clearance must be obtained from the State Historic Preservation Office (SHPO) prior to the start of construction activities. Therefore, pursuant to the Historic Sites Act (HSA) of 1935 (Title XVI, Chapter 1A, Subchapter II, Sections 461-467 of the USC), the NHPA of 1966 (Title XVI, Chapter 1A, Subchapter II, Section 460 of the USC), as amended, the Archeological and Historic Preservation Act of 1960 (Title XVI, Chapter 1B, Section 470aa of the USC), and Executive Order 11593 (*Protection and Enhancement of the Cultural Environment*), the archaeological, cultural, and historical resources were considered within the Fire Station 19 project area.

Under federal and state laws, one of the most important tasks of the SHPO and the Office of State Archaeology (OSA) is the review of development projects funded, licensed, or permitted by the federal or state governments. Generally referred to as the Environmental Review Process, it is the means by which archaeological and historic sites are considered in the planning stages of some of the many thousands of projects undertaken each year in North Carolina. When a proposed development action falls into one of the categories covered by the federal and state laws, the SHPO and the OSA are given the opportunity to review and comment on its potential for affecting significant sites. A significant site is defined as one which is either listed or eligible for listing in the NRHP. If the project action is considered likely to damage a significant site, some form of impact mitigation may be undertaken, either through project avoidance and site preservation or, if necessary, total or partial data recovery (i.e., salvage excavation).

No Action Alternative

Under the no-action alternative, no construction activities would take place; therefore, there would be no impacts to cultural resources.

Proposed Action Alternative

The North Carolina SHPO (within the North Carolina Division of Historical Resources, Office of Archives and History, Department of Cultural Resources) was consulted via letter dated September 15, 2010 as part of the Notice of Intent process. The SHPO responded in a letter dated October 12, 2010 that the agency “conducted a review of the project and are aware of no historic resources which would be affected by the project. Therefore, we have no comment on the project as proposed.” The SHPO further stated that their comments were made pursuant to Section 106 of the NHPA and the Advisory Council on Historic Preservation’s Regulations for Compliance with Section 106 codified at 36 CFR Part 800. A copy of the correspondence between MACTEC and the SHPO is provided as **Appendix A**.

The NHPA is the basis for tribal consultation provisions in the Advisory Council on Historic Preservation (ACHP) regulations. The two amended sections of NHPA that have a direct bearing on the Section 106 review process are Section 101(d)(6)(A), which clarifies that historic properties of religious and cultural significance to Indian tribes may be eligible for listing in the National Register, and Section 101(d)(6)(B),

which requires federal agencies, in carrying out their Section 106 responsibilities, to consult with any Indian tribe that attaches religious and cultural significance to historic properties that may be affected by an undertaking. The ACHP regulations incorporate these provisions and reflect other directives about tribal consultation from Executive Orders, Presidential memoranda, and other authorities. FEMA sent a letter on April 7, 2011 to the following tribes to determine interest: Cherokee Nation, Seminole Nation of Oklahoma, Seminole Tribe of Florida, Shawnee Tribe, Catawba Tribe, and Thlopthlocco Tribe. No responses have been received to date.

Finally, under the HSA of 1935, natural areas can be designated by the Secretary of the Interior as national landmarks and listed on the Registry of National Natural Landmarks. The National Park Service, National Natural Landmarks Program, indicates that there are 13 designated Natural Landmarks in North Carolina (NPS 2010). However, none of the designated Natural Landmarks occur within Forsyth County. There are no formally designated State of North Carolina parks, scenic or recreational areas, or natural areas on the project site; therefore, the construction of the proposed project will not impact State of North Carolina public lands, scenic areas, or natural areas.

With the above considerations, the proposed action will have no impact on cultural and historic resources

4.5 Socioeconomic Resources

No Action Alternative

Under the no-action alternative, no construction activities would take place; therefore, there would be no impacts to socioeconomic resources.

Proposed Action Alternative

4.5.1 Land Use and Zoning

The Fire Station 19 project site is comprised of old field habitat. No other upland vegetative communities or land use occupy the site. Historic land use was agriculture, probably improved pasture. The 1.22-acre site is zoned Residential Single Family (RS-20 District) (Forsyth County 2010b). The two parcels of land which comprise the 1.22-acre project site were annexed into the City of Winston-Salem on September 30, 2006. The RS-20 District is primarily intended to accommodate single family detached dwellings in suburban areas and also may be applicable to older, large lot developments constructed prior to the Unified Development Ordinance (Forsyth County 2010b). The minimum lot size in this district is 20,000 square feet, or 0.46 acre. Development considerations generally include access to adequate highways, water and sewer capacity, and minimizing impacts to adjoining uses.

By City of Winston-Salem ordinance, a fire station is a use-by-right and requires no zoning approval (within residential areas). The proposed fire station is in keeping with the City-County Planning Board's *Legacy Development Guide* (City of Winston-Salem 2008). The comprehensive plan is a general, long-range policy guide for decisions concerning the overall growth and development of Forsyth County and its eight municipalities. To ensure broad public involvement in creating the plan, a 21-member Citizens Steering Committee was created and focus groups were formed to develop a future vision and to look at particular issues. Numerous public meetings and discussions with stakeholder groups and organizations were held throughout the several years planning process.

Overall, the construction of the fire station complies with the allowed uses of the existing zoning category and future land uses; therefore, the proposed action is not expected to impact zoning and land use.

4.5.2 Environmental Justice

President Clinton signed Executive Order 12898 *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations* on February 11, 1994. Executive Order 12898 directs federal agencies to focus attention on human health and environmental conditions in minority and/or low-income communities. The goals of Executive Order 12898 are to: (1) achieve environmental justice; (2)

foster non-discrimination in federal programs that substantially affect human health or the environment; and (3) give minority or low-income communities greater opportunities for public participation in and access to public information on matters relating to human health and the environment.

The Fire Station 19 project site was recently annexed into the City of Winston-Salem. The 2000 census reports that the population of the City of Winston-Salem consisted of: 55.6% White; 37.1% Black or African American; 8.6% Hispanic or Latino; 1.1% Asian; 0.3% American Indian or Alaska Native; 0% Native Hawaiian and other Pacific Islander; and 1.6% from two or more races (U.S. Census Bureau 2010). The per capita income in 1999 was \$22,468, while the median household income was \$37,006. The most recent poverty figures, from 2008, indicate that 15% of the citizens in Forsyth County live in poverty. Within Winston-Salem, where the population is centered, 19% of the citizens live in poverty.

The City of Winston-Salem, under its mission statement, “provides quality, affordable services that ensure the health, safety, and well-being of citizens, while collaborating throughout the community to ensure its economic, social, and environmental vitality.” The core values of the city include “integrity, equity, accountability, teamwork, respect for all citizens, openness, fiscal soundness, and continuous learning and improvement.” The Winston-Salem Fire Department is committed to this mission statement and these values. Based on the results of a recent Performance Scorecard for the City of Winston-Salem, the score for Client Satisfaction for the Winston-Salem Fire Department was **A-**. This score was based on a citizen telephone survey conducted in October of 2008 (City of Winston-Salem 2010). These facts support the presumption that the proposed action will not have a disproportionate impact on the citizens of the city, as including low income or minority groups. Finally, the additional fire and emergency medical services that will be provided by the new fire station will improve public safety for all citizens, regardless of socioeconomic class, within an area that is presently experiencing increased response times due to the absence of a home territory facility.

4.5.3 Noise

The Noise Control Act (NCA) of 1972 provides federal regulation of noise, which is defined as undesirable sound. The NCA gives the EPA authority to establish guidelines for acceptable ambient noise levels. Outdoor sound levels in excess of 55 decibels are considered "normally unacceptable" for noise-sensitive land uses such as residences, schools, and hospitals under EPA guidelines. The proposed Fire Station 19 project site is zoned for residential. At the present time, noise levels in the vicinity of the proposed construction site are largely attributable to vehicular traffic on the surrounding streets; i.e., Glenn Hi Road and Crossfield Drive.

Temporary noise impacts will occur during the construction phase of the project. Site preparation activities as well as subsequent construction activities will result in elevated levels of noise generated by construction equipment. Construction activities will occur largely during daylight hours, as will the majority of the construction traffic traveling to and from the facility. During work hours, noise will be produced by construction equipment including backhoes, bulldozers, dump trucks, cement mixers, and/or loaders. At a distance of 50 feet, backhoes and tractors usually create noise levels in the range of 75 to 95 decibels (weighted) (EPA 1971). Efforts will be made to minimize this short-term impact and to restrict or prohibit construction activities during holiday and evening hours.

The proposed action will introduce long-term operational impacts to adjacent developed areas. Fire equipment and station alarms can range from approximately 95 decibels to 120 decibels during an emergency. Such intermittent elevated noise would only be sustained for extremely short durations, however, and would only be experienced when responding to emergency incidents or infrequent equipment testing. This impact cannot be entirely mitigated due to National Fire Protection Agency (NFPA) Standard 1901 and State Fire Marshal requirements for minimum sound-warning requirements for fire equipment when responding to an emergency. However, in an effort to reduce impacts, the alarms will only be used when necessary for emergency response and testing. Finally, because of the residential location, the fire department endeavors not to use sirens at the station, and instead activates them once the

truck is rolling down the street. This action minimizes noise impact on immediate neighbors.

To summarize, the proposed action is not anticipated to generate appreciable operational noise. Noise associated with daily operations will result in minor increases in localized noise compared to existing ambient levels.

4.5.4 Transportation

The Fire Station 19 project site is located within the City of Winston-Salem and is proximal to Interstate Highway US-40, NC-311, Union Cross Road, and High Point Road. In addition to many state roadways, Forsyth County is served by US-40. The proposed action will entail the construction of a fire station that will be staffed by a maximum of nine individuals per shift. In addition to staff commuting, traffic will consist of emergency call responses and occasional (random) visits by the public. Access drives will be built to connect the project site to Crossfield Drive and Glenn Hi Road; i.e., Crossfield Drive will provide ingress to the fire station for staff, visitors, and fire engines returning from emergency calls, while Glenn Hi Road will provide egress for fire engines responding to calls. The roads in the vicinity of the proposed project are adequately sized to handle the expected traffic load.

The location of the new fire station is not expected to adversely impact traffic in the local area (home territory). This determination is based in part on the results of the aforementioned formal site selection survey conducted by the City of Winston-Salem (see Section 3.1 [Proposed Action] of this report). In addition to the formal site survey, an in-house sketch review process was utilized to vet the project. This review included an examination of how potential (alternative) site locations, if selected, would impact the local transportation network/level of service. The review was conducted by the City/County Planning Department, with input from other municipal departments (i.e., Engineering, Streets, Utilities, Inspections, Fire Marshal, and Winston-Salem Department of Transportation [WSDOT]) and the North Carolina Department of Transportation (NCDOT). Finally, a Community Appearance Commission (City of Winston-Salem) reviewed and approved the project.

Construction activities could produce temporary impacts to the transportation system that include increases in noise, dust, vibration, congestion, and truck traffic along roadways within the proximity of the proposed project. Such impacts, however, will be minimal, short in duration, temporary, and of local influence only.

With these considerations, the construction and operation of the new facility is not expected to adversely impact the transportation system. Finally, with regard to public safety and transportation, traffic impacts during emergency response events will be minimized through the application of safe driving practices by fire department responders.

4.5.5 Public Services and Utilities

The Fire Station 19 project site is located within an area of the City of Winston-Salem that is zoned Residential Single Family. Potable water and sewer services will be provided to the developed site by the Winston-Salem/Forsyth County Utilities Division. Electricity will be provided by Duke Energy, while natural gas will be provided by Piedmont Natural Gas. Telephone service will be provided by AT&T. A backup diesel power generator and a diesel fuel storage tank will be placed at the facility. The 75 kilovolt-ampere generator will include a 24-hour fuel storage tank. The diesel storage tank will facilitate the refueling of the fire engine truck. This above-ground storage tank will have the capacity to hold 530 gallons of diesel fuel. It is presumed that the proposed action will place minimal additional demand on existing utility systems that are prepared to accommodate development expansion. Finally, the proposed action will improve fire and rescue services within the home territory by reducing response times to emergency fire and rescue calls.

4.6 Safety

4.6.1 Public Safety and Welfare

No Action Alternative

Under the no action alternative, the proposed fire station would not be built; therefore, the residents within the home territory would not experience public health and safety benefits associated with improved response times.

Proposed Action Alternative

The Fire Station 19 project will improve public health and safety services within the home territory by reducing response times to emergency fire and rescue calls. As previously discussed herein, the daily operations for Engine Company 19 and the Winston-Salem Fire Department as a whole would be positively affected by the construction of a new fire station within the home territory. The proposed action would have a direct and immediate effect on protecting the lives and property of the community within the home territory because of the enhanced response capabilities. The reduced response times would decrease the overall time spent on each response and reduce the risks to firefighters' health and safety. Faster response would allow the firefighters to spend "saved" time on recovery and other operational concerns. The new fire station would also make responses to mutual aid calls much faster and free up companies that are currently required as 2nd and 3rd in units due to Engine Company 19 response problems. To summarize, the proposed action will improve response times to emergency fire and rescue calls within the home territory, thereby resulting in public health and safety benefits to the residents of the community.

4.6.2 Seismic Safety

President Bush signed Executive Order 12699 *Seismic Safety of Federal and Federally Assisted or Regulated New Building Construction* on January 5, 1990. Section 2 of Executive Order 12699 states that the "purposes of these requirements are to reduce risks to the lives of occupants of buildings leased for federal uses or purchased or constructed with federal assistance, to reduce risks to the lives of persons who would be affected by earthquake failures of federally assisted or regulated buildings, and to protect public investments, all in a cost-effective manner." Furthermore, "local building codes shall be used in design and construction by those concerned with such activities ... to achieve appropriate seismic design and construction standards." To insure seismic safety, the Fire Station 19 facility will be constructed in compliance with the provisions of Executive Order 12699.

4.6.3 Environmental Health

The design of the Fire Station 19 facility will focus on increasing the efficiency of resources while reducing its impact on human health and the environment. Many small and large design elements will contribute to the overall "green" goal to achieve a 30% energy use reduction using the current code requirements. These design elements include: (1) high efficiency heating, ventilating, and air conditioning system; (2) energy efficient lighting and mechanical systems; (3) high efficiency light fixtures such as T5 fluorescents, compact fluorescents, and light-emitting diode fixtures; (4) use of programmable lighting controls and occupancy sensors; (5) high efficiency programmable thermostats to reduce energy demand; (6) humidity controls to improve the interior environment; (7) improved thermal envelope of the building by increasing the R value (thermal resistance) of the wall and roof systems; (8) eliminating heat transfer points with thermally broken windows and doors; (9) full cut-off, no glare, site light fixtures to reduce light pollution; and (10) reduced potable water consumption with low-flow plumbing fixtures.

The construction of the Fire Station 19 facility will include "green" building materials, such as reflective roofing surfaces and light colored paving materials to reduce heat gain. High efficiency or Energy Star equipment and appliances will be installed to reduce energy consumption within the station. These will

include the water heater and kitchen appliances (refrigerator, gas range, and dishwasher). A Vehicle Exhaust Extraction System will be installed to remove harmful and dangerous diesel fumes that linger in the bay and enter the work area and living quarters. This system will capture virtually 100% of the exhaust emissions.

During the construction phase itself, the contractor will be tasked with reducing the waste of energy, water and materials. This includes reducing the use of natural resources with the incorporation of construction materials with recycled content. Another goal is to reduce the amount of material going into the landfill by incorporating waste management practices that help limit the environmental impact. Hazardous waste (e.g., solvents, paints, etc.) generated from the construction of the facility will be managed in accordance with North Carolina hazardous waste management rules.

4.7 Cumulative Impacts

CEQ regulations for implementing NEPA require an assessment of cumulative effects during the decision-making process for Federal projects. Cumulative impacts are defined as the impact on the environment, which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future action. The “green” initiative presently occurring in contemporary design and construction projects is accelerating the use of strict environmental standards and energy efficiencies to increase sustainability and lower the impact of new building construction on the environment.

With regard to the proposed action, the Fire Station 19 facility will be sited within an area of the City of Winston-Salem which is favorably suited for development. The proposed project can be developed with either minimal impact or no impact to geology and soils, water resources, biological resources, air quality, historic and cultural resources, socioeconomic resources, and safety. It is consequently presumed that cumulative impacts should be minimal, or absent, with development of the site.

The Winston-Salem City Council is firmly dedicated to the “green” initiative through its construction, purchases, actions, and future plans. In May of 2007, the City Council adopted a resolution supporting the U.S. Conference of Mayors Climate Protection Agreement, committing the City of Winston-Salem to the long-range goal of reducing greenhouse gas emissions from local government operations and throughout the City of Winston-Salem. The resolution also established a Community Sustainability Program Committee and tasked each department to actively participate in the overall effort. The City Council also committed the city to changing new construction standards to above the code. This level of environmental diligence in construction standards, planning, and design will further avoid and minimize cumulative impacts.

The proposed action is essential to accommodate the anticipated future development and growth within the home territory. The project site is located within an area of the City of Winston-Salem that is zoned Residential Single Family. Future residential development, and potentially commercial development, will be dependent upon emergency response from the new Fire Station 19 facility. As such, the proposed action is consistent with reasonably foreseeable future action within this area and therefore no adverse cumulative impacts are anticipated.

Finally, the City of Winston-Salem and the Winston-Salem Fire Department anticipate development of five additional fire stations within the city limits in the next ten years; i.e., budget constraints allowing. The construction of these additional facilities is not expected to result in adverse cumulative impacts within the home territory or other areas of the city.

5.0 PUBLIC INVOLVEMENT, AGENCY COORDINATION, AND PERMITS

5.1 Public Involvement

The Winston-Salem Journal presented an article titled *New Fire Station OK'd* in its October 20, 2009 daily edition regarding the Fire Station 19 project. The article stated that the “recently annexed citizens in

the southeastern part of Winston-Salem are going to get a new fire station.” The article provided the following salient points; i.e., these comments were made by City Council staff during an October 19, 2009 City Council meeting, and were phrased and summarized by a Winston-Salem Journal staff reporter for the newspaper article:

- "The fire station would be built near Glenn High School;
- Station construction likely would be finished within two years;
- The fire station will be paid in part with a \$2 million grant from the federal stimulus package;
- The City has three years to spend the money;
- The fire station would improve services to citizens annexed in 2006; and
- The City had planned to build a fire station in that area, but the stimulus grant sped up the City's plans."

The Winston-Salem *Capital Projects Monitoring Report* provides financial information for key projects occurring in the City of Winston-Salem (Winston-Salem 2010). The objective of these semi-annual reports is to formally and regularly provide capital project status updates from project managers to ensure that projects are being completed on a timely basis, and to identify project balances that can be re-directed, if needed. The status of each active project is coded; i.e., projects "on hold", projects "facing challenges, but progressing", or projects "progressing as planned." In the May 2010 semi-annual report, the Fire Station 19 project was coded as "progressing as planned." The completion date for the project was identified as October 2012. A brief description for the project was provided in the report: "This project provides for land purchase and planning for a two-bay fire station accommodating up to nine personnel per shift. The station will be designed so that a ladder company can be added in the future. Station will serve southeast Winston-Salem." The report also included the following status comments: "Staff are finalizing the building permit as well as other bidding and construction documents. The City is currently awaiting authorization from the Department of Homeland Security to proceed with the environmental assessment as well as final grant guidelines." The aforementioned information will be updated in the next semi-annual report. The semi-annual reports can be viewed by the public on the City of Winston-Salem web site (www.cityofws.org/).

Finally, as discussed in Section 4.5.1, the proposed fire station is in keeping with the City-County Planning Board's *Legacy Development Guide*. To ensure broad public involvement in creating the comprehensive plan (i.e., the guide for growth and development in Forsyth County and its eight municipalities), a 21-member Citizens Steering Committee was created and focus groups were formed to develop a future vision and to look at particular issues. Numerous public meetings and discussions with stakeholder groups and organizations were held throughout the several years planning process.

A public notice is required for the draft EA (Appendix B). The public, Tribes, and agencies will have the opportunity to comment on the EA for 15 days after publication of the notice. The notice identifies the action, location of the proposed site, participants, location of the draft EA, and who to write to provide comments. FEMA will review all substantive written comments for issues that need to be addressed with the City and will incorporate any resolutions into the final EA, as appropriate.

5.2 Agency Coordination

Coordination with governing agencies will be the responsibility of the City of Winston-Salem (Engineering Division), and will be delegated to the appropriate project consultant(s) and/or contractor(s).

Agency scoping letters were prepared by MACTEC and submitted to the USFWS, the NCDENR NHP, and the North Carolina SHPO. These letters and the return (response) correspondence from the regulatory agencies are included in **Appendix A**.

Tribal consultation was initiated by FEMA.

5.3 Permits

No known federal permits will be required for the completion of the Fire Station 19 project. The following state and local permits or approvals have been obtained:

- **Post Construction Stormwater Management Permit** – Issued on September 11, 2009 by the City of Winston-Salem Stormwater Division;
- **Right of Way Encroachment Contract** (for water and sewer utilities) – Issued on May 21, 2009 by the NCDOT;
- **Erosion and Sedimentation Control Plan** – *Letter of Approval* issued on May 18, 2009 by the Land Quality Section of the NCDENR Division of Land Resources;
- **National Pollutant Discharge Elimination System Permit** – Issued on May 18, 2009 by NCDENR and provided to the City of Winston-Salem;
- **City of Winston-Salem Zoning Permit** – By City of Winston-Salem ordinance, a fire station is a use-by-right and requires no zoning approval (within residential areas);
- **NCDOT Driveway Permit** – *Letter of Approval* issued on May 11, 2009 by the NCDOT;
- **City of Winston-Salem Commercial Driveway Permit** – Approved/issued on May 5, 2009 by City of Winston-Salem and NCDOT;
- **Sanitary Sewerage Collection System** – *Permit and Authorization to Construct* document issued on May 15, 2009 by City/County Utilities Commission for construction and use of a sanitary sewerage collection system;
- **Water Distribution System** – *Permit and Authorization to Construct* document issued on May 15, 2009 by City/County Utilities Commission for construction and use of a water distribution system.

All construction and required regulatory permits will be maintained and posted at the construction site.

6.0 CONCLUSION

The draft EA evaluated environmental and historic resources that could be affected by the Proposed Action. The evaluation did not identify any significant adverse impacts associated with physical, water, biological, cultural, socioeconomic resources or public safety. Implementing the Proposed Action, along with any conditions associated with permits or approvals, is expected to avoid or reduce minor adverse effects associated with the action. Following public involvement, FEMA will determine whether to issue a FONSI for the Proposed Action.

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FIGURES

APPENDIX A
AGENCY SCOPING LETTERS AND RESPONSES

APPENDIX B
PUBLIC NOTICE