



Study Area Code: 518006
Study Area Name: Sweetwater, WY
Program Year: 2014
Contact Person: Chris Reno
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Contact Email: creno@unionwireless.com
Carrier Reference Name: Sweetwater WY-2

PROJECT STATUS DESCRIPTION

SECTION I: DESCRIPTION OF OVERALL PROJECT PLAN

- 3G RNC/MSC/GGSN/SGSN PLUS 4G EPC

In order to launch this system, the necessary 3G and 4G core network needed to be completed and turned operational. This system totals roughly \$3.4 million in network core equipment, which will be shared across all 6 census tracts granted funding to Union Telephone Company in the FCC 901 Mobility Fund.

The core is located in Cheyenne, Wyoming and is fed via dual OC12 networks, giving full redundancy and capacity to support all tower sites related to this project and other network growth on the Union Wireless network. Additional OC12's are already planned as demand increases and also to provide carrier diversity in case of an outage on one particular carriers' network.

STATUS – This portion of the project is complete. Please refer to Section II for more details on the status of the network deployment.

- MIDDLE MILE BACKHAUL

In addition, Union is upgrading its middle mile capabilities in key sections of Wyoming that will allow adequate backhaul facilities to its new 3G and 4G network core.

The first of these upgrades is located in Carbon County, WY between the towns of Hanna and Saratoga. This project connects two new service providers and allow connectivity into several key remote offices within Union Telephone Company's network.

STATUS – This portion of the project is complete. Please refer to Section II for more details on the status of the network deployment.

The second middle mile upgrade was determined to be necessary after 3G/4G deployments in and around the FCC Mobility Fund Phase I deployments starting becoming accessible to consumers. The steep



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uptake in data services required further upgrades from Rawlins north to the towns of Casper and Riverton to maintain the long-term data speed requirements across all six census tracts as required by fund. STATUS – This portion of the project is under construction. Please refer to Section II for more details on the status of the network deployment.

- SWEETWATER WY-2 (T56037971600) 3G HSPA+

This is another tract that covers a lot of geography with little to no people. The area however includes many oil and gas fields, so while no people live in the area, many people work in the areas on a daily basis. Even with the large geographical areas, much of this is already covered by our 2G network which means we have several key sites that will provide a lot of the coverage with simply an overlay. This build out consists of five overlays and one new build.

TYPE OF BACKHAUL – Given the remote nature of sites in and around Wyoming, Union Wireless is using licensed microwave wherever feasible and unlicensed microwave if no available licenses are capable of being obtained. We are targeting at least 25 Mbps of IP backhaul to each cell tower.

SPECTRUM – In this market, we are using a combination of 850 MHz and 1900 MHz to ensure we stay within current CGSA boundaries. All 850 MHz sites fall within existing CGSA boundaries and do not affect existing Union filings, as the intention is to keep GSM fully operational alongside UMTS. The sole new site falls in a gap of our current CGSA, which we have filed for and intend to build the site on 850 MHz.

KEY RISKS OR CHALLENGES – The new tower location is on BLM land, with the major only challenge being commercial power availability. Union Wireless has already solved the power concern with the acquisition of Cells-On-Wheels (COW's) that operate power from Wind and Solar generation. This platform can generate peak power of almost 8,000 Watts and has 1,500 Amp/Hr of battery backup. Combined with a backup generator, this system has already been deployed in the region successfully for almost 18 months, with little to no use of the backup generator.

After deployment of the Solar and Wind powered COW, Union Telephone Company fully intends to construct a permanent version of the cell location, to ensure that there is operational support for the long term and that the operations exceed minimum guidelines. Ultimately, the site may be powered by similar technologies of Solar and Wind as the COW, as described.



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The other main risk is unknown aspects of terrain in the region and the ability to get coverage into some of the shadowed areas. This was one reason why HSPA+ technology was selected over LTE, given the much more clear understanding on how to operate and optimize this type of network. HSPA+ has also been chosen in order to ensure data speeds meet or exceed the requirements but also that the voice aspects are also solid in the area as well.

STATUS – This portion of the project is in construction and deployment. Please refer to Section II for more details on the status of the network deployment.



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Contact Telephone Number: 307-782-6131
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Carrier Reference Name: Sweetwater WY-2

PROJECT STATUS DESCRIPTION

SECTION III: PROJECT BUDGET STATUS

Overlay Sites

- 5 each
 - New hardware Required
 - New Node B Base Station gear \$60,000 each
 - New Microwave gear for IP Backhaul \$70,000 each
 - Upgrades to tower antenna complex \$20,000 each
 - Labor to related projects \$50,000 each

Each overlay site estimated at \$200,000 cost each, total \$1,000,000 capital contribution

New Sites

- 1 each
 - New hardware Required
 - Tower installation
 - Leasing, zoning, permitting costs \$65,000 each
 - Tower site construction \$75,000 each
 - Tower Steel \$45,000 each
 - Lines, antennas, generators \$50,000 each
 - New Node B Base Station gear \$60,000 each
 - New Microwave gear for IP Backhaul \$50,000 each
 - Upgrades to tower antenna complex \$5,000 each
 - Labor to related projects \$50,000 each

Each overlay site estimated at \$400,000 cost each, for a \$400,000 total capital contribution for new sites.

Other related projects include roughly 1 microwave hop to upgrade in order to accommodate this area, which will be roughly \$150,000.

This totals roughly \$1.55 million in capital costs related to the build out.

Union is projecting incremental operating expenses for this site over 5 years to be \$1.95 million.



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BUDGET STATUS –

Total Support Applied to Design/Construction/Deployment (Capital Contribution): **\$1,271,237.91 – ON BUDGET**

Total Support Applied to Maintenance: **\$0 – ON BUDGET**