1.0 PURPOSE OF RURAL AUDIENCE SERVICE ANALYSIS

West Virginia Educational Broadcasting Authority (WVEBA) is seeking funding from CPB which requires a rural audience service analysis.

2.0 RURAL AUDIENCE SERVICE ANALYSIS METHODOLOGY

According to the grant verbiage a grantee seeking Rural Audience Service Station qualification must have a coverage area population equal to or less than 40 people per square kilometer. The following formulates how the analysis was conducted for WVEBA.

All of WVEBA’s full service stations were queried directly from the FCC’s website:

https://www.fcc.gov/media/radio/fm-query

The Keyhole Markup Language (KML) files were downloaded for each station for further processing. The contours were acquired this way since it is from an
official source and not generated by aftermarket software manufacturer which may have subtle differences in coverage areas.

The KML files were imported into a geographic information system (GIS) program called ArcMap Version 10.2.2 for display and analysis. The 2010 Census Block shape file polygons were downloaded directly from the US Census Bureau:

http://www.census.gov/cgi-bin/geo/shapefiles2010/main

Each Census Block location contains a 2010 census population count for the area it covers. The centroid for each polygon was then calculated using ArcMap’s "Feature to Point" tool under the “Data Management Tools” and then was display for further analysis. Population tabulation was conducted using an ArcMap’s “Spatial Join” function such that each census block location which falls within a broadcast station’s contour is summed together for a total count. The contour geometric area was calculated using ArcMap’s “Calculate Geometry” function which finds the area within the contour in KM. Once the total contour population and total contour area have been derived, they are divided to obtain a pop/km figure for reporting.

3.0  RURAL AUDIENCE SERVICE ANALYSIS RESULTS

3.1 WVBL(FM) = 40.2 POP/KM²
3.2 WVBY(FM) = 25.2 POP/KM²
3.3 WVDS(FM) = 13.2 POP/KM²
3.4 WVEP(FM) = 36.2 POP/KM²
3.5 WVKM(FM) = 26.1 POP/KM²
3.6 WVNP(FM) = 77.3 POP/KM²
3.7 WVPB(FM) = 49.1 POP/KM²
3.8 WVPG(FM) = 50.3 POP/KM²
3.9 WVPM(FM) = 54.4 POP/KM²
3.10 WVPW(FM) = 20.9 POP/KM²
3.11 WVWS(FM) = 9.2 POP/KM²
3.12 WVWV(FM) = 60.3 POP/KM²
Average for state network: 38.5 POP/KM^2

4.0 CERTIFICATION AND QUALIFICATIONS

Kessler and Gehman Associates (KGA) is a professional telecommunications consulting engineering firm specializing in all phases of communications internationally since 1967. KGA is certified by the Board of Professional Engineers and has offices located in Gainesville, Florida. KGA is licensed to practice professional engineering and has been involved in virtually every phase of broadcast and wireless communications from initial designs to final inspections.

The qualifications of the firm's key technical personnel are a matter of record with the Federal Communications Commission (FCC). KGA has represented many clients before the FCC in a variety of matters including Rule Makings, requests for experimental authorizations and waiver requests of the Commission's rules to accommodate specialized telecommunications systems and submissions of various applications for permits.

Kessler and Gehman Associates, Inc. (KGA)'s qualifications are of a matter of record with CPB. KGA was hired by CPB and worked closely with Dianne Yoo to overlook CPB Grant No. 12102 to ensure that budgeted equipment in the FY08-01 application were properly implemented by the applicant.

The foregoing statement and the report regarding the aforementioned engineering work are true and correct to the best of my knowledge. Executed on January 4, 2016.

KESSLER AND GEHMAN ASSOCIATES, INC.

Ryan Wilhour
Consulting Engineer
APPENDIX A - RURAL AUDIENCE SERVICE ANALYSIS MAPS

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2010 Census Population: 90,184
Contour Area: 2,240.8 km^2

Population Density = 40.2 pop/km^2

WVBL(FM)
BLUEFIELD, WV
The map shows the population distribution within the 2010 Census Blocks of Beckley, WV.

- **2010 Census Population:** 193,862
- **Contour Area:** 7,704.6 km$^2$
- **Population Density:** 25.2 pop/km$^2$

The map includes a legend with population ranges:
- 1 - 31
- 32 - 94
- 95 - 225
- 226 - 576
- 577 - 2224

The map also highlights the WVBY 60dBu F(50,50) Contour.
2010 Census Population: 108,389
Contour Area: 8,210.5 km²

Population Density = 13.2 pop/km²
2010 Census Population: 325,387
Contour Area: 8,993.1 km^2

Population Density = 36.2 pop/km^2

Legend
People Within 2010 Census Blocks
- 1 - 38
- 39 - 120
- 121 - 278
- 279 - 589
- 590 - 1741

WVEP 60dBu F(50,50) Contour

WVEP(FM)
MARTINSBURG, WV

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Gainesville, FL 32607
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Coordinate System:
Central Meridian:
1st Std Parallel:
2nd Std Parallel:
Latitude of Origin:
2010 Census Population: 105,105
Contour Area: 4,024.0 km\(^2\)

Population Density = 26.1 pop/km\(^2\)
2010 Census Population: 530,372
Contour Area: 6,858.7 km^2

Population Density = 77.3 pop/km^2

Legend
People Within 2010 Census Blocks
- 1 - 43
- 44 - 147
- 148 - 416
- 417 - 1242
- 1243 - 2825

WVPN 60dBu F(50,50) Contour
2010 Census Population: 326,114
Contour Area: 6,644.9 km²
Population Density = 49.1 pop/km²
2010 Census Population: 151,808
Contour Area: 3,020.6 km^2

Population Density = 50.3 pop/km^2

Legend
People Within 2010 Census Blocks
- 1 - 26
- 27 - 74
- 75 - 172
- 173 - 339
- 340 - 640
- WVPG 60dBu F(50,50) Contour

Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community.

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WVPG(FM)
PARKERSBURG, WV

Coordinate System:
Central Meridian:
1st Std Parallel:
2nd Std Parallel:
Latitude of Origin:
2010 Census Population: 454,173
Contour Area: 8,350.9km²
Population Density = 54.4 pop/km²

Legend
People Within 2010 Census Blocks
- 1 - 31
- 32 - 98
- 99 - 251
- 252 - 677
- 678 - 1626
WVPM 60dBu F(50,50) Contour

Sources: Esri, DeLorme, HERE, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community

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WVPM(FM)
MORGANTOWN, WV

Coordinate System:
Central Meridian:
1st Std Parallel:
2nd Std Parallel:
Latitude of Origin:
2010 Census Population: 161,954
Contour Area: 7,736.4 km^2

Population Density = 20.9 pop/km^2

Legend
People Within 2010 Census Blocks
- 1 - 28
- 29 - 99
- 100 - 278
- 279 - 733
- 734 - 1773

WVPW 60 dBu F(50,50) Contour

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WVPW(FM)
BUCKHANNON, WV

Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community
2010 Census Population: 19,651
Contour Area: 2,139.4 km²
Population Density = 9.2 pop/km²

Legend
People Within 2010 Census Blocks
- 1 - 13
- 14 - 37
- 38 - 77
- 78 - 149
- 150 - 379
- WVWS 60dBu F(50,50) Contour

Source: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCan, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community

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WVWS(FM)
WEBSTER SPRINGS, WV

Coordinate System:
Central Meridian:
1st Std Parallel:
2nd Std Parallel:
Latitude of Origin:
2010 Census Population: 497,808
Contour Area: 8252.6 km²
Population Density = 60.32 pop/km²

Legend
People Within 2010 Census Blocks
- 1 - 37
- 38 - 116
- 117 - 273
- 274 - 703
- 704 - 1585

WVWV(FM) 60dBu F(50,50) Contour

Sources: Esri, HERE, DeLorme, Mapinfo, Increment P Corp., GEBCO, USGS, FAO, NPS, NRO, U.S. Census, Geological Survey, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community

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WVWV(FM)
HUNTINGTON, WV