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Huntsville, AL

Meter Data Management System (MDMS)

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MDMS Standard Meter Data Format

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REVISION HISTORY

Version	Description	Date	Author(s)
-	Initial Version	25 August 2016	Mary Ingram
A	Correction to Date Time format in Section 3.0	3 October 2016	Mary Ingram
B	Revisions to Multiple Sites Reporting to a Single EEDRS/UMCS and addition of Multiple EEDRS/UMCS Reporting to a Single Gateway. Corrections to EEDRS unit assignment. Miscellaneous document cleanup.	30 December 2016	Mary Ingram
C	Corrected Table 1 to reflect corrected units of Measure, also added 2 values for Single Phase meter data collection related to (Amps) and (Volts). 3 Phase meters will continue to report using letter designations (AmpsA, AmpsB, etc.) and (VoltsA, Volts B, etc.). Made various clarifications throughout the document. Moved .csv file sample figures to Appendix A.	22 March 2017	Phillip Wendling, Mary Ingram, Justin Goodwin
D	Updated Table 1 to reflect new or updated MDMS Meter Parameter Definitions added: PowerSum, GenSolarEnergySum, GenWindEnergySum, GenHydroEnergySum, SteamSum, ElectricUsage, GasUsage, WaterUsage, SteamUsage, GenSolarProdUsage, GenWindProdUsage, and GenHydroProdUsage	21 February 2020	Scott Johnson, Justin Goodwin

1.0 OVERVIEW

This document defines the process and standard format of the meter naming convention and the comma separated value (.csv) files which are generated by the Meter Data Management System (MDMS) Gateway servers using information obtained from a site's Enterprise Energy Data Reporting System (EEDRS) or its Utility Monitoring & Control System (UMCS), as applicable. The .csv files are used by the MDMS servers to process meter data that is ultimately reported via the MDMS public facing website. This document also explains the data requirements, processes, and coordination necessary for Utility Provider (UP) companies to enable UP meter data integration into MDMS. The document also provides guidance to MDMS EEDRS vendors on the data requirements, process, and coordination necessary. The process for collecting meter data will be slightly different when the data originates from an MDMS Gateway server versus when the data originates from a UP site.

1.1 Acronyms

AAP	Army Ammunition Plant
AMSD	Army Metering Service Desk
BGAD	Blue Grass Army Depot
CF	Cubic Feet
.csv	Comma Separated Values (file format)
EEDRS	Enterprise Energy Data Reporting System
GAL	Gallons
HQIIS	Headquarters Installation Information System
IAW	In Accordance With
kW	Kilowatt
kWh	Kilowatt Hour
lbs	Pounds
MDMS	Meter Data Management System
UMCS	Utility Monitoring & Control System
USACE	U.S. Army Corps of Engineers
UTC	Coordinated Universal Time

2.0 INSTRUCTIONS FOR EEDRS OR UMCS INSTALLERS

2.1 Meter Data Collection via EEDRS or UMCS SQL Database Interface

There are two main tasks involved with the creation of the .csv files ingested by the MDMS Enterprise:

1. The MDMS Gateway server requests values from the vendor's EEDRS or UMCS SQL database
2. The MDMS Gateway creates the .csv file

There are several subtasks that have to be handled on a case by case basis, and different vendors have different database structures that must be accounted for, but the MDMS Gateway server primarily communicates with the SQL database located on the EEDRS/UMCS server.

Figure 1 below depicts the relationship between reporting meters, the EEDRS (or UMCS as applicable) server, and the MDMS Gateway server. Note that there are two data storage locations on the EEDRS/UMCS server – the vendor application location, also referred to as the "front end" that will "trend" data to SQL, and the SQL database that receives the "trend data" from the front end and stores the data in preparation for collection by the MDMS Gateway. If errors are produced at the Gateway during data collection, the

EEDRS/UMCS vendor may need to adjust the parameters so that the front end is trending data that will allow proper data collection.

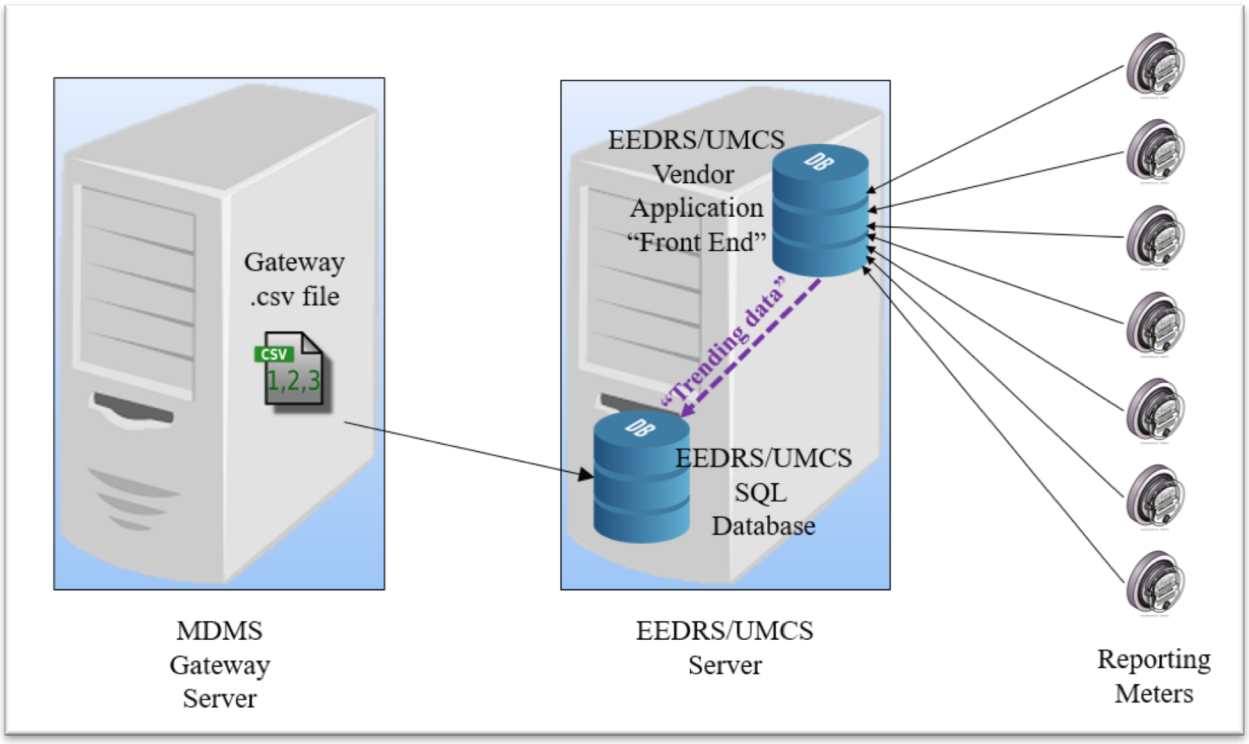

Figure 1. MDMS Gateway to EEDRS/UMCS Interface

2.2 MDMS Gateway Request from EEDRS/UMCS

There are multiple vendors that provide EEDRS and UMCS servers (i.e. Niagara AX, InetSupervisor, Honeywell EBI, Metasys ADX, Tridium, Automated Logic, etc.). Since each vendor has a different database structure, the initial site coordination is pertinent in establishing the correct inputs for each field of the database.

The three values the MDMS Gateway requests from the SQL database located on the EEDRS/UMCS server include:

1. Meter point (This includes the meter location and commodity)
    - See format requirements below in sections 2.2.1, 2.2.2 and 2.2.3
2. Time stamp (MDMS prefers the time stamp to be UTC time, but if the site decides to use Local time, the Army Metering Service Desk (AMSD) **must** be notified and coordinated with via email, usarmy.coe-huntsville.cehnc.mbx.armymeterhelp@mail.mil, or phone, 256-971-2141)
    - Time stamp format must adhere to the following: MM/DD/YYYY HH:MM:SS AM/PM
3. Value (the actual reading of the register or point from the meter)

2.2.1 Single Site Reporting to a Single EEDRS/UMCS to a Single MDMS Gateway

EEDRS/UMCS vendors shall adhere to the following Meter Point naming convention when the system is configured IAW Figure 2.

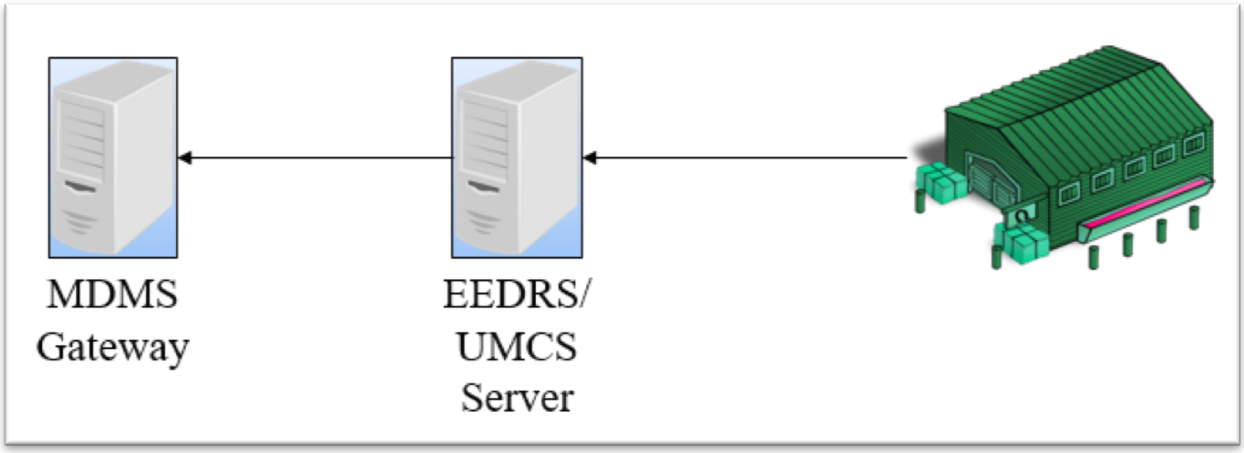

Figure 2. Single Site Reporting to a Single EEDRS/UMCS and a Single MDMS Gateway

The meter point should adhere to the following format with underscores as delimiters:

- ***Building_#_Meter Name_Unit***

  Each section of the name is defined as follows:

  - Building = enter *BLDG or Building*
  - # = enter the number of the building that has received the installed meter
  - Meter Name = enter a unique identifier. This may be a number (e.g. serial number) or a word describing the meter (e.g. *METER1).*
  - Unit = enter the unit in accordance with (IAW) the *"MDMS Search Value"* column (the first column in Table 1 on page 8)

The following meter points are all different valid examples of names created by the EEDRS/UMCS:

- BLDG_400_METER1_KWH **or** Building_400_METER1_KWH
- BLDG_400_METER3_GAS **or** Building_400_ METER3_GAS
- BLDG_400_METER2_WATER **or** Building_400_METER2_WATER
- BLDG_400_METER2_WTR **or** Building_400_METER2_WTR
- BLDG_400_METER2_Freq **or** Building_400_METER2_Freq

Note that the Building, #, and Meter Name elements must remain identical for an individual meter. Only the Unit will change for a meter with multiple commodities, as applicable. The resulting .csv file generated by the MDMS Gateway for this scenario is depicted in Appendix A in Figure A-1.

2.2.2 Multiple Sites Reporting to Multiple Corresponding EEDRS/UMCS to a Single MDMS Gateway

EEDRS/UMCS vendors shall adhere to the following Meter Point naming convention when the system is configured IAW Figure 3.

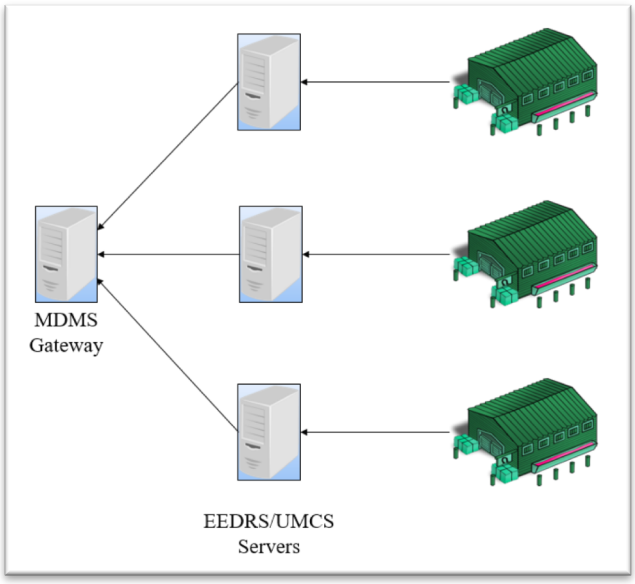

Figure 3. Multiple Sites Reporting to Multiple Corresponding EEDRS/UMCS to a Single Gateway

The meter point should adhere to the following format with underscores as delimiters:

- ***Building_#_Meter Name_Unit***

  Each section of the name is defined as follows:

  - Building = enter *BLDG or Building*
  - # = enter the number of the building that has received the installed meter
  - Meter Name = enter a unique identifier. This may be a number (e.g. serial number) or a word describing the meter (e.g. *METER1).*
  - Unit = enter the unit in accordance with (IAW) the *"MDMS Search Value"* column (the first column in Table 1 on page 8)

The following meter points are all different valid examples of names created by the EEDRS/UMCS:

- BLDG_400_METER1_KWH **or** Building_400_METER1_KWH
- BLDG_400_METER3_GAS **or** Building_400_ METER3_GAS
- BLDG_400_METER2_WATER **or** Building_400_METER2_WATER
- BLDG_400_METER2_WTR **or** Building_400_METER2_WTR
- BLDG_400_METER2_Freq **or** Building_400_METER2_Freq

Note that the Building, #, and Meter Name elements must remain identical for an individual meter. Only the Unit will change for a meter with multiple commodities, as applicable. The resulting .csv files generated by the MDMS Gateway for this scenario is depicted in Appendix A in Figures A-2, A-3, and A-4.

2.2.3 Multiple Sites Reporting to a Single EEDRS/UMCS to a Single MDMS Gateway

EEDRS/UMCS vendors shall adhere to the following Meter Point naming convention when the system is configured IAW Figure 4.

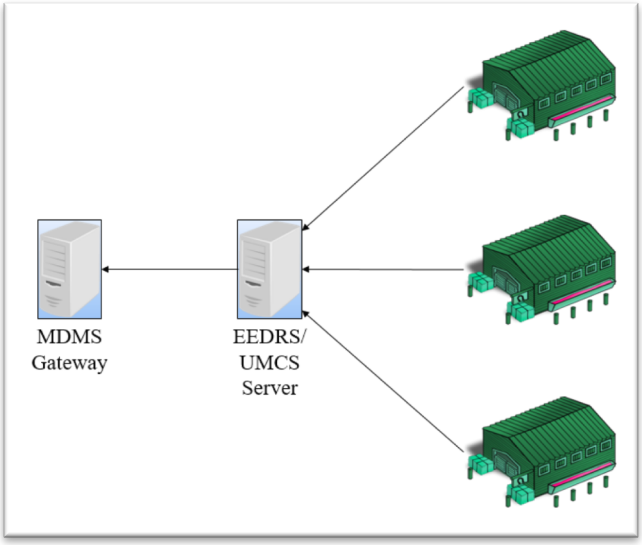

Figure 4. Multiple Sites Reporting to a Single EEDRS/UMCS to a Single MDMS Gateway

The meter point should adhere to the following format with underscores as delimiters:

- ***Site_Building_#_Meter Name_Unit***

  Each section of the name is defined as follows:

  - *Site* = enter site name prefix provided by the MDMS O&M contractor
  - *Building* = enter *BLDG or Building*
  - *#* = enter the number of the building
  - *Meter Name* = enter a unique identifier. This may be a number (e.g. serial number) or a word describing the meter (e.g. *METER1)*
  - *Unit* = enter the unit in accordance with (IAW) the *"MDMS Search Value"* column (the first column in Table 1 on page 8)

The following meter points are valid examples of names created by the EEDRS/UMCS:

- FTEUSTIS_BLDG_100_METER1_KWH **or** FTEUSTIS_Building_100_METER1_KWH
- FTKNOX_ BLDG_200_METER3_KWH **or** FTKNOX_ Building_200_METER3_KWH
- FTMEADE_ BLDG_1200_METER1_GAS **or** FTMEADE_ Building_1200_METER1_GAS

The resulting .csv file generated by the MDMS Gateway for this scenario is depicted in Appendix A in Figure A-5.

2.2.4 MDMS Meter Parameter Definitions

Table 1 depicts the *MDMS Search Values* and each of the corresponding *Units* and *Variable* values. These parameters are case sensitive and if the entry does not match the table below, the data transfer will not be successful. The *MDMS Search Value* must be placed in the meter point to accurately import meter data.

Table 1. MDMS Meter Parameter Definitions

MDMS Search Value	MDMS "Unit" Tail	MDMS "Variable"	Units	Parameter Description
Status	sta	MeterStatus	-	Meter status
Model	mod	MeterModel	-	Meter Model
SN	sn	SerialNumber	-	Meter Serial Number
Freq	hz	Frequency	Hertz	Frequency
KW	kW	DemandAvg	kW	Real Power
KWD	kW	DemandPeak	kW	Demand Power
KVAR	kVAR	Reactive Power	kVAR	Reactive Power
KWH	kWh	NetEnergySum	kWh	Meter reading of electricity
Volts	V	Voltage	Volts	Total Voltage for a Single-Phase Meter
VoltsA	V	VoltageAB	Volts	Voltage for a 3 Phase Meter on Phase A (A-B)
VoltsB	V	VoltageBC	Volts	Voltage for a 3 Phase Meter on Phase B (B-C)
VoltsC	V	VoltageCA	Volts	Voltage for a 3 Phase Meter on Phase C (C-A)
Amps	A	Current	Amps	Total Current for a Single-Phase Meter
AmpsA	A	CurrentA	Amps	Current for a 3 Phase Meter on Phase A
AmpsB	A	CurrentB	Amps	Current for a 3 Phase Meter on Phase B
AmpsC	A	CurrentC	Amps	Current for a 3 Phase Meter on Phase C

MDMS Search Value	MDMS "Unit" Tail	MDMS "Variable"	Units	Parameter Description
PF	-	PowerFactor	-	Total Power Factor
PFA	-	PowerFactorA	-	Power Factor for a 3 Phase Meter on Phase A
PFB	-	PowerFactorB	-	Power Factor for a 3 Phase Meter on Phase B
PFC	-	PowerFactorC	-	Power Factor for a 3 Phase Meter on Phase C
GASCF	cf	GasSum	Cubic Feet	Gas (Cubic Feet)
GASTHERMS	therms	GasSum	Therms	Gas(therms)
WATER, WTR	gal	WaterSum	Gallons	Water (Gallons)
VoltsAN	V	VoltageAN	Volts	Line To Neutral for a 3 Phase Meter on Phase A
VoltsBN	V	VoltageBN	Volts	Line To Neutral for a 3 Phase Meter on Phase B
VoltsCN	V	VoltageCN	Volts	Line To Neutral for a 3 Phase Meter on Phase C
LAT	LAT	Latitude	-	Latitude of the Meter Location (decimal degrees)
LONG	LONG	Longitude	-	Longitude of the Meter Location (decimal degrees)
WATTS	W	PowerSum	Watts	Electricity; sum of all phases in Watts
STEAM	lbs	SteamSum	Pounds	Meter reading of steam
SOLAR	kWh	GenSolarEnergySum	Kilowatt Hours	Meter reading of electricity generated by solar power
WIND	kWh	GenWindEnergySum	Kilowatt Hours	Meter reading of electricity generated by wind power
HYDRO	kWh	GenHydroEnergySum	Kilowatt Hours	Meter reading of electricity generated by hydroelectric power
ELECUSE	kWh	ElectricUsage	Kilowatt Hours	Usage value of electricity (calculated by current meter reading minus previous meter reading)

MDMS Search Value	MDMS "Unit" Tail	MDMS "Variable"	Units	Parameter Description
GASUSECF	cf	GasUsage	Cubic Feet	Usage value of gas (calculated by current meter reading minus previous meter reading)
GASUSETHERMS	therms	GasUsage	Therms	Gas(therms)
STEAMUSE	lbs	SteamUsage	Pounds	Usage value of steam (calculated by current meter reading minus previous meter reading)
WATERUSE	gal	WaterUsage	Gallons	Usage value of water (calculated by current meter reading minus previous meter reading)
SOLARPROD	kWh	GenSolarProdUsage	Kilowatt Hours	Usage value of electricity generated by solar power
WINDPROD	kWh	GenWindProdUsage	Kilowatt Hours	Usage value of electricity generated by wind power
HYDROPROD	kWh	GenHydroProdUsage	Kilowatt Hours	Usage value of electricity generated by hydroelectric power

3.0 APPENDIX A

Below are the various sample .csv files generated by the MDMS Gateway in various scenarios.

```
"Installation","Site","Building","Meter","Date Time","Variable","Value","Unit"
"Redstone Arsenal","Redstone Arsenal","100","REDS_BLDG_100_METER_2","1/20/2015 12:15:00 PM","NetEnergySum","156080.875","kWh"
"Redstone Arsenal","Redstone Arsenal","100","REDS_BLDG_100_METER_2","1/20/2015 12:30:00 PM","NetEnergySum","156092.28125","kWh"
"Redstone Arsenal","Redstone Arsenal","100","REDS_BLDG_100_METER_2","1/20/2015 12:45:00 PM","NetEnergySum","156105.25","kWh"
"Redstone Arsenal","Redstone Arsenal","100","REDS_BLDG_100_METER_2","1/20/2015 1:00:00 PM","NetEnergySum","156120.125","kWh"
"Redstone Arsenal","Redstone Arsenal","100","REDS_BLDG_100_METER_2","1/20/2015 1:15:00 PM","NetEnergySum","156136.3125","kWh"
"Redstone Arsenal","Redstone Arsenal","100","REDS_BLDG_100_METER_2","1/20/2015 1:30:00 PM","NetEnergySum","156152.59375","kWh"
```

Figure A-1. Sample .csv file for Single Site Reporting to a Single EEDRS/UMCS and a Single MDMS Gateway

```
"Installation","Site","Building","Meter","Date Time","Variable","Value","Unit"
"Fort Campbell","Fort Campbell","501","CAMP_BLDG_501_METER_1","8/30/2016 7:15:00 AM","NetEnergySum","85358.59375","kWh"
"Fort Campbell","Fort Campbell","501","CAMP_BLDG_501_METER_1","8/30/2016 7:30:00 AM","NetEnergySum","85364.8125","kWh"
"Fort Campbell","Fort Campbell","501","CAMP_BLDG_501_METER_1","8/30/2016 7:45:00 AM","NetEnergySum","85371.1875","kWh"
"Fort Campbell","Fort Campbell","501","CAMP_BLDG_501_METER_1","8/30/2016 8:00:00 AM","NetEnergySum","85377.34375","kWh"
"Fort Campbell","Fort Campbell","501","CAMP_BLDG_501_METER_1","8/30/2016 8:15:00 AM","NetEnergySum","85383.90625","kWh"
```

Figure A-2. Sample Fort Campbell .csv file for Reporting to Fort Campbell Gateway

```
"Installation","Site","Building","Meter","Date Time","Variable","Value","Unit"
"Holston Army Ammunition Plant","Holston Army Ammunition Plant","400","HSAAP_BLDG_400_METER_1","01/30/2016 1:45:00 PM","NetEnergySum","89282","kWh"
"Holston Army Ammunition Plant","Holston Army Ammunition Plant","400","HSAAP_BLDG_400_METER_1","01/30/2016 2:00:00 PM","NetEnergySum","89289","kWh"
"Holston Army Ammunition Plant","Holston Army Ammunition Plant","400","HSAAP_BLDG_400_METER_1","01/30/2016 2:15:00 PM","NetEnergySum","89297","kWh"
"Holston Army Ammunition Plant","Holston Army Ammunition Plant","400","HSAAP_BLDG_400_METER_1","01/30/2016 2:30:00 PM","NetEnergySum","89304","kWh"
"Holston Army Ammunition Plant","Holston Army Ammunition Plant","400","HSAAP_BLDG_400_METER_1","01/30/2016 2:45:00 PM","NetEnergySum","89311","kWh"
"Holston Army Ammunition Plant","Holston Army Ammunition Plant","400","HSAAP_BLDG_400_METER_1","01/30/2016 3:00:00 PM","NetEnergySum","89318","kWh"
```

Figure A-3. Sample Holston AAP .csv file for Reporting to Fort Campbell Gateway

```
"Installation","Site","Building","Meter","Date Time","Variable","Value","Unit"
"Blue Grass Army Depot","Blue Grass Army Depot","840","BGAD_BLDG_840_METER_1","4/15/2016 7:15:00 AM","NetEnergySum","120358.59375","kWh"
"Blue Grass Army Depot","Blue Grass Army Depot","840","BGAD_BLDG_840_METER_1","4/15/2016 7:30:00 AM","NetEnergySum","120364.8125","kWh"
"Blue Grass Army Depot","Blue Grass Army Depot","840","BGAD_BLDG_840_METER_1","4/15/2016 7:45:00 AM","NetEnergySum","120371.1875","kWh"
"Blue Grass Army Depot","Blue Grass Army Depot","840","BGAD_BLDG_840_METER_1","4/15/2016 8:00:00 AM","NetEnergySum","120377.34375","kWh"
"Blue Grass Army Depot","Blue Grass Army Depot","840","BGAD_BLDG_840_METER_1","4/15/2016 8:15:00 AM","NetEnergySum","120383.90625","kWh"
```

Figure A-4. Sample Blue Grass Army Depot .csv file for Reporting to Fort Campbell Gateway

```
"Installation","Site","Building","Meter","Date Time","Variable","Value","Unit"
"MEDCOM Fort Detrick","MEDCOM Fort Detrick","100","MD_FTEUSTIS_BLDG_100_METER_1","7/12/2016 9:30:00 PM","NetEnergySum","3335495","kWh"
"MEDCOM Fort Detrick","MEDCOM Fort Detrick","100","MD_FTEUSTIS_BLDG_100_METER_1","7/12/2016 9:15:00 PM","NetEnergySum","3320571","kWh"
"MEDCOM Fort Detrick","MEDCOM Fort Detrick","100","MD_FTEUSTIS_BLDG_100_METER_1","7/12/2016 9:00:00 PM","NetEnergySum","3299618","kWh"
"MEDCOM Fort Detrick","MEDCOM Fort Detrick","100","MD_FTEUSTIS_BLDG_100_METER_1","7/12/2016 8:45:00 PM","NetEnergySum","3290057","kWh"
"MEDCOM Fort Detrick","MEDCOM Fort Detrick","100","MD_FTEUSTIS_BLDG_100_METER_1","7/12/2016 8:30:00 PM","NetEnergySum","3281665","kWh"
"MEDCOM Fort Detrick","MEDCOM Fort Detrick","200","MD_FTKNOX_BLDG_200_METER_1","7/12/2016 9:30:00 PM","NetEnergySum","36242181","kWh"
"MEDCOM Fort Detrick","MEDCOM Fort Detrick","200","MD_FTKNOX_BLDG_200_METER_1","7/12/2016 9:15:00 PM","NetEnergySum","36238133","kWh"
"MEDCOM Fort Detrick","MEDCOM Fort Detrick","200","MD_FTKNOX_BLDG_200_METER_1","7/12/2016 9:00:00 PM","NetEnergySum","36233458","kWh"
"MEDCOM Fort Detrick","MEDCOM Fort Detrick","200","MD_FTKNOX_BLDG_200_METER_1","7/12/2016 8:45:00 PM","NetEnergySum","36219191","kWh"
"MEDCOM Fort Detrick","MEDCOM Fort Detrick","200","MD_FTKNOX_BLDG_200_METER_1","7/12/2016 8:30:00 PM","NetEnergySum","36205033","kWh"
```

Figure A-5. Sample Truncated .csv file for Multiple Sites Reporting to a Single EEDRS/UMCS at Fort Detrick