1.0 Introduction

The State of Colorado's Pipeline Safety Program Mapping System (PSPMS) is a Geographic Information System (GIS) dataset, composed of intrastate transmission, distribution, and gathering pipelines. Authority for the collection and publication of this data comes from 4 *Code of Colorado Regulations* (CCR) 723-11.4 CCR 723-11 states that the NPMS Operator Standards Manual is incorporated by reference; more technical information about standards and procedures can be found there.

The PSPMS is built and maintained using information supplied by pipeline operators. Operators are asked to provide geospatial data about their holdings as well as contact information, and must update their submission annually on March 31st.

1.1 Regulatory Requirements

4 CCR 723-11 RULES REGULATING PIPELINE OPERATORS AND GAS PIPELINE SAFETY incorporates by reference the NPMS Operator Standards Manual, updated October 2017. This includes:

- Data Appropriate for use in the Pipeline Safety Program Mapping System. A complete data submission includes the geospatial data, attribute data, and metadata for all intrastate transmission, distribution, and gathering pipelines in the state of Colorado operated by a company.
- The Name and address of the person with primary operation control to be identified as its operator
- Public Contact information which is used by members of the public to contact the operator for additional information about pipeline holdings.
- Updates of the above information to reflect changes in pipeline holdings.

1.2 Submission Requirements

Information must be submitted by March 31st of every calendar year, using the PUC e-filings system. Operators are required to examine their data annually and determine if any part of their submission (geospatial, attribute, metadata, or public contact information) has changed. If any of these components have changed, the operator must resubmit their data to the PSPMS. The PSPMS prefers that operators resubmit the entire pipeline system with the exception of previously abandoned lines. Do not resubmit lines already abandoned in the PSPMS. If you are unsure of which lines are already in the PSPMS as abandoned for your company please contact PSP staff at charles.shikany@state.co.us. Operator ID numbers and contact information for the submission must be included.

An owner or operator may request a waiver or variance in accordance with 4 CCR 723-1-1003, Waivers and Variances.

2.0 General Requirements

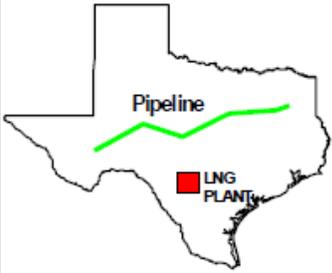This section establishes general PSPMS terms and requirements.

Geospatial Data	Attribute Data	Metadata	Contact Information
Digital data with lines and/or points marking the location of pipelines, LNG Plants, and breakout tanks.	A computer database containing descriptive information about pipelines or LNG Plants. There is one record in the database for each *pipeline segment*.	Descriptive information about how the geospatial and attribute data were prepared (i.e., data about data). This information includes the data projection, datum, and units.	Information about the person or entity who serves as a contact for the pipeline system. Contains **either** a person's name and title **or** the name of an entity. Also contains address, phone, and email information.

Figure 2-1. The types of NPMS data.

The PSPMS includes location and selected attributes of gas transmission, distribution, and gathering pipelines. **Pipelines and facilities other than those described below should not be included in your PSPMS submission.**

Gas transmission line – A pipeline system, other than a gathering line, that
1. Transports gas from a gathering line or storage facility to a distribution center, storage facility, or large-volume customer that is not downstream from a distribution center. A large-volume customer may receive similar volumes of gas as a distribution center. Factories, power plants, and institutional users of gas are included.
2. Operates at a hoop stress of 20 percent or more of specified minimum yield strength (SMYS) or
3. Transports gas within a storage field.

   Additional information about PHMSA-regulated gas lines is in CFR §192.

Gas Distribution Lines - A pipeline other than a gathering or transmission line that is subject to the jurisdiction of the PUC and includes:
1. Low pressure distribution systems
2. Mains that serve or are designed to serve, as a common source of supply, for more than one service line
3. Master Meter Operator/LPG system (major and minor)

Gas Gathering Lines - A pipeline that transports gas from a current production facility to a transmission line or main
1. Types A, B, and C

Pipeline System - Pipeline system – All parts of a natural gas transmission line or hazardous liquid line through which gas or hazardous liquid is transported. By definition, only one firm can operate a pipeline system. Operators should assign unique names to each of their pipeline systems. A pipeline system may have an unlimited number of branches. Each pipeline system must be represented by one or more pipeline segments.
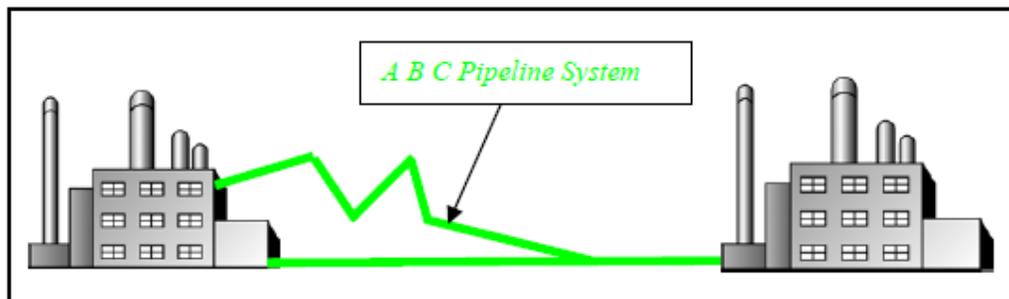

Figure 2-2. Sample of annotated pipeline system.

Pipeline Segment - A linear feature representing part or all of a pipeline system. A pipeline segment must have only two ends. No branches are allowed. A pipeline segment may be a straight line or may have any number of vertices. Each pipeline segment must be uniquely identified. The number of pipeline segments should be kept to the minimum needed to represent a pipeline system and its associated attributes. A unique line segment in the computer-aided drafting (CAD) or GIS dataset should represent each pipeline segment.
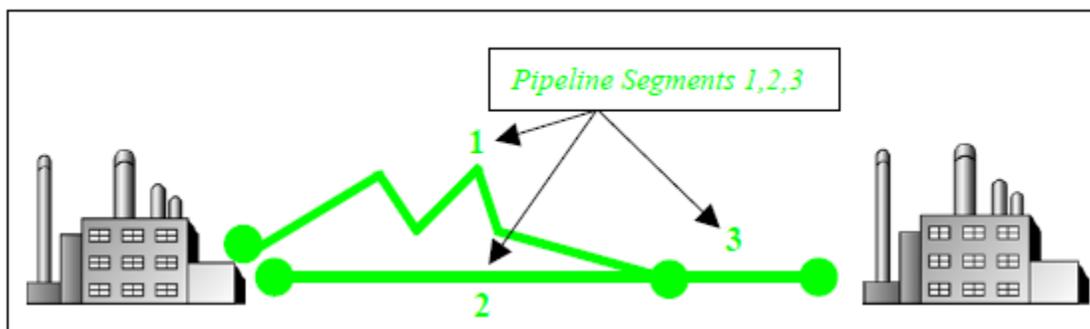

Figure 2-3. A Pipeline system consisting of three pipeline segments

A pipeline system should be broken into multiple pipeline segments for only two reasons:
1. to represent a branch or intersection with another pipeline segment, and/or
2. to allow for a change of associated attributes such as diameter.

Pipeline intersection – A point where a physical connection between two pipelines occurs. A commodity from one pipeline can flow into another pipeline(s), either through a branch within a pipeline system or a connection between two pipeline systems. When submitting digital geospatial data, line segments in the CAD or GIS data set should be broken at the point of intersection. The intersection will be a common endpoint (node) representing the two pipeline segments.

Pipeline crossing – A point where two or more pipelines cross, but where there is no physical connection between the pipelines. Pipeline segments should not be broken at pipeline crossings.
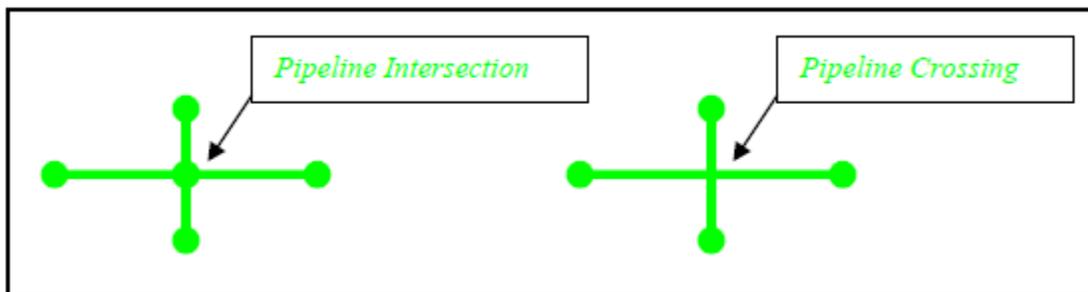

Figure 2-4. Sample annotation of pipeline intersection and pipeline crossing.

Pipeline corridor – A pipeline corridor is a linear area where two or more pipelines (either part of the same or different pipeline systems) are closely grouped in a single right-of-way. Pipeline corridors pose a cartographic challenge. In digital files, multiple lines are required, and each separate representation must be stored in individual layers or files. Pipeline corridors should be clearly annotated, particularly where pipelines join or exit the corridor.

Pipeline status – The status of a pipeline or pipeline segment may be defined by one of the following options:
1. In-service – the pipeline or pipeline segments currently transports natural gas or hazardous liquid.
2. Inactive/Idle – the pipeline or pipeline segment is maintained to a degree that it may, in the future, be potentially brought back into service.
3. Retired – the pipeline or pipeline segment has been taken out of service and is no longer being maintained, but it has not yet been permanently abandoned.
4. Abandoned – the pipeline or pipeline segment has been permanently removed from service

2.1 PSPMS File Naming Conventions

Operators are requested to use the following formula when assigning file names:
Type of File Code + OPID + hyphen + 4-Digit Sequential Number + 3-Character Alphanumeric Extension
Sample file name: G12345-0001.DWG

Type of File Code (one-character, alpha):
> G = Geospatial Data Only
> A = Attribute Data Only
> B = Both Geospatial and Attribute Data
>   (Also use "B" when different geospatial and attribute files should have the same name. For example, an export from ESRI's ArcView software might have the following names: B12345-0001.SHP, B12345-0001.SHX, B12345-0001.DBF.)

OPID (five digits [maximum], numeric) – This is the identification number assigned by the Pipeline And Hazardous Materials Safety Administration to pipeline and LNG Plant operators, for user-fee purposes. The OPID has five digits or fewer. If you don't know your OPID, go to the "Operator ID search" link on the NPMS Website.

4-Digit Sequential Number (four-digit, numeric, starting with 0001) – This is used to avoid assigning several files with the same file name.

Extension (three-character default from software package) – Use the default extension for export from the software package (e.g., .DWG, .SHP, .DBF, etc.).

2.2 GIS Form Submission

When submitting your data submission, we ask that you also fill out the accompanying GIS form found here (webpage not ready). Please fill out the appropriate contact information so that if there are any problems with your submission, we can resolve them quickly.

3.0 Attribute Data

Operators are required to provide descriptive information about the pipelines when submitting to the PSPMS. The attribute data is essential information about the pipeline such as its name and commodity transported.

Field Name	Field Type	Field Length	Short Description	Full Description	Acceptable Values	Required Field
OP_NAME	C	40	Operator Name	The company name that physically operates the pipeline system	Character	Y
OPER_LINK	I	8	Unique Link ID	Link between the geospatial elements (pipeline segments) and their respective attribute records. Assigned by the operator or the operator's software package (i.e., COVER-ID, MSLINK_ID, etc.). Note the OPER_LINK and the PLINE_ID may be identical. Note that once processing is complete, the OPER_LINK value will be removed from the data by NPMS staff as it will no longer be needed.	Positive Integer	Yes - If your attributes are **not** included in the geospatial file No - If your attributes are included in the geospatial file
OPID	I	5	Operator Number	Unique tracking number assigned by PHMSA to the company that physically operates the pipeline system. If you do not know your firm's OPID, check with your DOT/Regulatory Compliance department or the NPMS Web site.	Positive Integer	Y
SYS_NM	C	40	Operator Name	Assigned by the operator. The operator's name for a functional grouping of pipelines.	Character	Y
SUBSYS_NM	C	40	Sub System Name	Assigned by the operator. A unique name for a smaller sub-section of a pipeline	Character	N

				system. A subset of SYS_NM.		
PLINE_ID	C	20	Pipeline ID	Assigned by the operator. This is a unique identifier for a specific section of pipeline within a pipeline system.	Character	Y
COMMODITY	C	3	Commodity Category	Abbreviation for the primary commodity carried by the pipeline system. Valid Liquid Commodities: CRD=crude oil, PRD=non-HVL product, AA=anhydrous ammonia, LPG=liquefied petroleum gas, NGL=natural gas liquids, OHV=other HVLs, CO2=carbon dioxide, ETH=fuel grade ethanol, and EPL=abandoned pipelines that previously transported a liquid Valid Gas Commodities: NG=natural gas, PG=propane gas, SG=synthetic gas, HG=hydrogen gas, OTG=other gas, and EPG=empty gas. Note that when propane is transported as a liquid, use the LPG commodity abbreviation. The PG abbreviation should only be used when the commodity is in gaseous form. Note that when the pipeline is permanently abandoned,	CRD, PRD, AA, LPG, NGL, OHV, CO2, ETH, EPL, NG, PG, SG, HG, OTG, EPG	Y

				the use of EPL or EPG should represent the commodity that was previously transported. For instance, a natural gas transmission line that was later filled with water during the permanent abandonment process would be coded EPG because a gas commodity was last transported. Please report if the pipeline is filled with water, nitrogen or another fill material in the Commodity Description. Note that EPG and EPL may only be used for abandoned pipelines. Idle and Retired pipelines should report the commodity last transported. If the pipeline is purged, please report if the pipeline is filled with water, nitrogen or another fill material in the Commodity Description.		
CMDTY_DTL1	C	3	Commodity Detail 1	Abbreviation for the primary commodity's first subcategory detail. If the primary commodity defined in the COMMODITY field is not CRD, PRD, or NG, this field should be left blank. If the primary commodity in the COMMODITY field is CRD, PRD, or NG and the	CRW, CRR, RGS, RFD, RKJ, OTR, ETB, BDB, OBI, NG1, NG2, NG3, NG4, <Null>	N

				subcategory is not known or stated, this field should be left blank. The primary commodity CRD has the following subcategories: CRW=sweet crude, CRR=sour crude. The primary commodity PRD has the following subcategories: RGS=refined non-ethanol blended gasoline, RFD=refined fuel oil, diesel, RKJ=refined kerosene, jet fuel, OTR=other refined and/or non-HVL petroleum products, ETB=ethanol blended gasoline, BDB=biodiesel blend, OBI=other biofuels. The primary commodity NG has the following subcategories: NG1=pipeline quality or tariff quality natural gas, NG2=wet but non-sour natural gas, NG3=sour but nonwet natural gas, NG4=wet, sour natural gas.		
CMDTY_DTL2	C	3	Commodity Detail 2	Abbreviation for the primary commodity's second subcategory detail. Refer to the CMDTY_DTL1 field for additional information and valid values.	CRW, CRR, RGS, RFD, RKJ, OTR, ETB, BDB, OBI, NG1, NG2, NG3, NG4, \<Null>	N
CMDTY_DTL3	C	3	Commodity Detail 3	Abbreviation for the primary commodity's second subcategory detail. Refer to the	CRW, CRR, RGS, RFD, RKJ, OTR,	N

				CMDTY_DTL1 field for additional information and valid values.	ETB, BDB, OBI, NG1, NG2, NG3, NG4, <Null>	
CMDTY_DESC	C	40	Commodity Description	Descriptive information of the commodities carried by the pipeline system. For example, "NATURAL GAS" or "PROPANE." If purged, report if that pipeline was filled with water, nitrogen, or another material.	Character	N
DESIGNATION	C		Designation of pipeline as transmission distribution, or gathering	Transmission = T, Distribution =D Gathering =G,	T,G,D	Y
WALL_THICK	D	8	Wall Thickness of Pipe	Wall thickness of pipe in inches	Real number	N
SMYS	D	8	Specified Minimum Yield Strength	Specified Minimum Yield Strength as calculated by Barlow's Formula	Real Number	N
GRADE	C	3	Steel Grade	Grade of Steel Pipe [NULL] if non-steel pipe	A, B, X42, X46, X52, X56, X60, X65, X70, [NULL]	n
NPMS_DATA	C	1	NPMS Data provided	For Transmission, provided attribute data reported to NPMS. If NPMS Data is provided, put Y for yes and if not put N for no. See Figure 3-1 in the NPMS Operator Standards Guidance for additional attribute data to be	y/n	Y

				included with transmission pipe		
STATUS_CD	C	1	Pipeline Status Code	Describes the status of the pipeline segment as of the reporting year (i.e., December 31 of the previous year). I=in service, D=idle, R=retired (all subcategories of an active pipeline as defined by PHMSA), or B=permanently abandoned.	I, D, B, R	Y
DATE_ABND	Date	8	Date Abandoned	Describes the date the pipeline was abandoned, Null if unknown or not abandoned.	Date	Y
MAOP	I	5	Max Allowable Operating Pressure	Maximum (Allowable) Operating Pressure in psig (pounds per square inch gauge) Sample value: 1000	real number	Y
TEST_PRES	C	8	Test Pressure	Pressure of original pressure test in psig, with up to one decimal place (use [null] if segment has not had a pressure test)		Y - if segment had pressure test
NOM_DIAM	D	5	Nominal Diameter	Nominal diameter of the pipeline segment, in inches (three decimal places, ##.###).	real number	Y
COAT_TYPE	I	2	Coating	Identify whether pipe segment is 1=coal tar enamel, 2=fusion bonded epoxy, 3=asphalt, 4=cold applied tape, 5=polyolefin, 6=extruded polyethylene, 7=field applied epoxy, 8=paint, 9=composite, 10=other, 11=no coating	1,2,3,4,5,6,7,8,9,10,11	Y

SDR	C	5	Standard dimension Ratio	Method of rating a pipe's durability against pressure. (Examples include SDR11, SDR11.5, ect.) [NULL] if non plastic pipe	SDR7, SDR7.3, SDR9, SDR9.3, SDR11, SDR11.5, SDR13.5, SDR15.5, SDR17, SDR19, SDR21, SDR26, SDR32.5, [NULL]	Y
MATERIAL	I	1	Type of pipe material	Identify whether pipe segment is 1=cast iron, 2=plastic, 3=steel, 4=composite, 5=other	1, 2, 3, 4, 5	Y
CORROSION_PROT	C	3	Corrosion Protection	Corrosion protection installed on the pipeline Galvanic=G, Rectified/Impressed Current=RIC ,None=N or Not Applicable=NA	G, RIC, N, NA	Y
HCA	C	1	HCA	Pipe segment is in a High Consequence Area (per §192.903)	Y, [NULL]	Y
MCA	C	1	MCA	Pipe segment is in a Moderate consequence area (per §192.3)	Y, [NULL]	Y
QUALITY_CD	C	1	Data Quality Code	Operator's estimate of the positional accuracy of the submitted pipeline segment. E=excellent: within 50 feet, V=very good: 50–300 feet, G=good: 301–500 feet, P=poor: 501–1000 feet, U=Unknown.	E, V, G, P, U	Y

NOTES: 1 I = Integer; C = Character; D = Double.
2 Y = Yes; N = No.

Figure 3-1

3.1 Positional Accuracy Requirement

It is requested that the data have a minimal positional accuracy of ±500 feet of its known geographic location. Research indicates that most operators can easily achieve ±500 foot accuracy with current in-house data records.

3.2 Required and Optional Attributes

Each pipeline segment or LNG plant submitted must be accompanied by a corresponding record and attribute database table. Each Pipeline segment must have the following attribute data included with the geospatial data:
- Operator Name
- Fluid Type
- Designation of pipeline as transmission, distribution or gathering
  - for transmission pipelines only, the additional data provided to the National Pipeline Mapping System (NPMS) by the operator
- abandoned as defined in 49 CFR 192.3 and inactive pipelines.
- the maximum allowable operating pressure;
- the testing pressure;
- the pipe description (i.e., nominal diameter, coating, standard dimension ratio, and material);
- description of corrosion protection (i.e., Galvanic, Rectified/Impressed Current, or NA); and
- identify as HCA/MCA on each segment for class location, as applicable.

Additional Attribute data may be submitted, see NPMS Operator Standards Manual Figure 3-1 for additional attributes and their formatting details.

3.3 Rules for Attribute Data Input

When submitting digital attribute information, adhere to the following rules:
1. Use only UPPERCASE when defining field names.
2. Use only UPPERCASE when inputting data into the attribute tables.
3. Omit all punctuation except for periods (.), spaces ( ), backslashes (\), colons (:), commas (,), hyphens (-), and underscores (_). Semicolons (;) should be used only as a delimiter when submitting attribute data in ASCII-delimited text files.
4. Use only NPMS-specified abbreviations.
5. Be consistent. Names and terms should be exactly replicated throughout a submission. For example, if a pipeline system is named Pennsylvania Line (SYS_NM = "PENNSYLVANIA LINE"), the operator should consistently use the full and exact name.

The operator should not use alternative names like "Penn Line" or "PA Line" or "Pennsylvania."

6. Use the correct OPID. OPID is an accounting number assigned by the U.S. Department of Transportation, Pipeline and Hazardous Materials Safety Administration to firms that operate pipelines and LNG plants. If you do not know your firm's OPID number, check with your firm's accounting department. An Operator ID search tool can be found on the home page of the NPMS Website.

4.0 Geospatial Data

Geospatial data represent pipeline systems (linear) elements. This data must be submitted in digital format; please contact PSPMS staff if you are unable to meet this standard. All submissions should meet the ±500-foot accuracy standard.

4.1 General Requirements for Digital Geospatial Data

The following discusses various requirements and formats that operators should meet when submitting digital geospatial data.

1. Use a real world coordinate system based on North American Datum (NAD) 1983 or NAD 1983. The Repository accepts unprojected data in decimal degrees and data that employ a common projection scheme such as Universal Transverse Mercator (UTM) or State Plane. Projected data may employ either English (feet) or metric (meters) measurement units. In all cases, clearly state the datum, coordinate system/ projection, and measurement units in the accompanying metadata.

    Note: Digital data that does not employ real world coordinates, such as CAD files that employ an origin point of 0,0 in the lower left hand corner of the drawing cannot be accepted by the Repository.

2. Provide spatially accurate data. NPMS required positional accuracy is described in section 3.1. Base maps or other source materials used to develop digital geospatial data submissions should have a scale between 1:24,000 (1" = 2,000') and 1:1,200 (1" = 100'). The spatial accuracy of the digital submission should be clearly stated in the accompanying metadata.

3. Submit only qualifying pipeline data. The submitted digital file should contain only pipeline segments representing natural gas transmission lines, hazardous liquid trunk lines, and points representing LNG plants. Separate all other data such as gathering lines, spur lines, valves, and base map data such as buildings, roads, property lines, political boundaries, scanned images, etc.

    Note: Curves should be represented by a pipeline segment with as many vertices/shape points as is required to provide the appropriate cartographic appearance. CAD system arcs should be avoided.

4. Ensure that the reproduction and submission of any map or data does not violate existing copyright laws.

5. Review data for quality. Common problems include:
    a. overshoots and undershoots at pipeline intersections,
    b. stray points and lines that do not represent a pipeline or LNG plants, often left from deleting non-NPMS data, and/or
    c. duplicate points and lines.
6. Use commonly accepted digital media when using E-filings.

4.2 Digital Submission Techniques

The instructions below provide general assistance to operators using some of the more popular GIS and CAD software packages. Some currently available GIS formats are not discussed, but may be acceptable. Operators interested in submitting data in a format not provided for in these instructions should contact PSPMS Staff to determine its acceptability.

The instructions may not correspond to the exact version of the software package the operator is using, nor do they reflect any software customizations that may have been made. Operators who encounter problems are encouraged to contact their software vendor for technical support.

4.2.1 ESRI ArcGIS Shapefile Format Data Submission

Operators may submit data to the PSPMS using the shapefile format of ESRI's ArcGIS desktop software. The following describes how shapefiles must be prepared:
1. Isolate the data to be submitted to the PSPMS into a single line (pipeline)
2. Right-click on the layer in the Table of Contents and select the Data > Export Data command to export the data. This will create three files (.SHP, .SHX, .DBF). If using ESRI's ArcMap desktop software, use the "Export to Shapefile" command.
3. Submit all exported files, including the .SHP (geospatial data file), the .SHX (index file), and the .DBF (attribute data file) and the .PRJ (projection file) for each layer to the PSPMS.

For your convenience, a template ESRI shapefile has been developed that contains attributes that meet the PSPMS and NPMS requirements. If you wish to utilize these templates, you may download a zipped file containing the shapefile and geodatabase file from the Making a Submission page on the NPMS Web site (www.npms.phmsa.dot.gov). Please note that the defined projection for these templates is Geographic Latitude Longitude NAD 83 Decimal Degrees; if your data is not in this projection, please re-project as necessary before adding data.

4.2.2 ESRI ArcGIS Geodatabase Format Data Submission

Operators may submit data to the PSPMS using the personal geodatabase or file geodatabase format of ESRI's ArcGIS desktop software. The following describes how the personal/file geodatabase must be prepared:

4. In the case of a personal geodatabase, submit the output .mdb file. In the case of a file geodatabase, zip the GDB folder and submit it to the PSPMS..

For your convenience, an ESRI personal and file geodatabase template has been developed that contains attributes that meet the PSPMS and NPMS requirements. If you wish to utilize these templates, you may download a zipped file containing the templates from the Making a Submission page on the NPMS Web site (www.npms.phmsa.dot.gov). Please note that the defined projection for these templates is Geographic Latitude Longitude NAD 83 Decimal Degrees; if your data is not in this projection, please re-project as necessary before adding data.

4.2.3 AutoCAD Data Submission

The PSPMS accepts geospatial data in a CAD format using the .dwg, .dgn or .dxf file extensions. Making a CAD submission requires some additional steps and precautions:

1. A coordinate system must be associated with the data and recorded properly in the Metadata. A NAD83 geographic coordinate system is preferred for CAD submissions to the PSPMS.
2. The CAD drawing MUST be stripped of ALL data layers other than the pipelines intended for submission to the PSPMS. PSPMS staff will not accept any CAD submission with other included data layers, such as roads or other pipeline related facilities. Every line in the drawing will be considered a pipeline. Additionally, the submission should not include any annotation.

A CAD submission that disregards any of these requirements will not be accepted as a complete PSPMS submission.
*An ESRI Geodatabase is the preferred method for PSPMS submissions.

4.2.4 Smallworld Data Submissions

Operators may submit geospatial data using Smallworld. The following procedures have been developed to assist operators in submitting this type of data. It is important to note that the data must conform to the datum, projection, scale, and control requirements outlined in these standards.

1. Isolate the data (real world objects) to be submitted to the PSPMS.
2. Use the FME (Feature Manipulation Engine), an add-on package available from Smallworld or Safe Software Inc.
3. Submit the Shape file to the PSPMS.

4.2.5 Coordinate Digital Data Submissions

This type of submission will include a file containing geospatial coordinate data.

The file formats for linear pipelines and point-based pipeline facilities, LNG plants, and breakout tanks are different. Both file formats are described below, including record layouts.

Geospatial File for Linear Pipeline Digital Data Submissions. To submit digital data for pipelines, the operator has the option of creating one of two types of files: an unformatted comma delimited text/ASCII file or a Microsoft Excel file. In both cases, the file will contain longitude coordinate values, latitude coordinate values, and the OPER_LINK value. Each point contains a single longitude value and a single latitude value. A single pipeline is represented by a starting point, an end point, and any inflection point. The number of points needed to represent the pipeline is determined by the operator. At the minimum two points are needed – the starting point and the end point. However, the operator should be sure to use enough points to accurately portray the pipeline. Longitude and latitude coordinates should be stated in decimal degrees (no projection). A minimum of five decimal places is required. Western Hemisphere longitude should be a negative value. Acceptable values are -180.00000 to 0.00000. Northern Hemisphere latitude should be a positive value. Acceptable values are 0.00000 to 90.00000.

The OPER_LINK value is assigned by the operator and is the link between the geospatial segment and the pipeline attributes. A collection of points which represents a single pipeline segment is assigned to a single OPER_LINK value. For instance, a pipeline segment which has a starting point, one inflection point, and an end point has three sets of coordinates all related to the same OPER_LINK value.

Text/ASCII file format:
The text/ASCII file format will include the unique identifier (OPER_LINK), followed by the longitude value which is followed by the latitude value; each value should be separated by a comma (note that there should be no space following the comma). Additional coordinate pairs will be listed in order of appearance along the line segment until all coordinate pairs are displayed. Each line segment submitted must contain a minimum of two coordinate pairs to represent the beginning and end of a straight line. The text/ASCII file should not include any formatting, including tabs, bold text, or underscoring, as it interferes with processing of the information. The text/ASCII file extension of the output file should be .txt. Refer to Figure 4-1 for an example of text/ASCII format geospatial coordinate file.
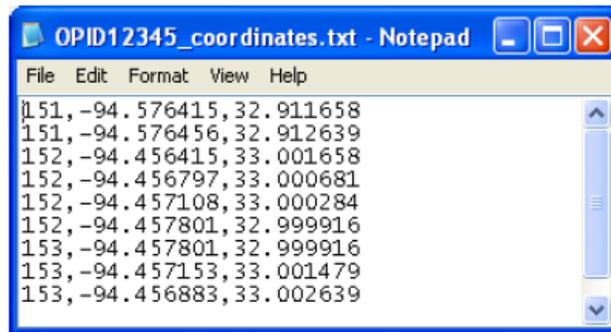
Figure 4-1. Text/ASCII file containing pipeline coordinates.

Microsoft Excel file format:

The Microsoft Excel file format contains a separate record/row for each coordinate pair (longitude and latitude). The file should contain three columns: one column storing the unique identifier (OPER_LINK) value; one column storing the longitude coordinate; and one column storing the latitude coordinate. Coordinate pairs will be listed in order of appearance along the line segment until all coordinate pairs are displayed. The Excel file extension of the output file should be .xls or xlsx. Refer to Figure 4-2 for an example of an Excel format geospatial coordinate file.
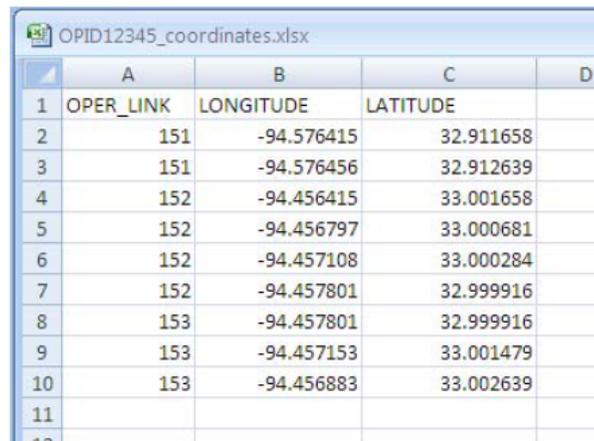
Figure 4-2. Excel file containing pipeline coordinates.