

## Acronyms

AA	Anhydrous Ammonia
AGA	America Gas Association
ANSI	American National Standards Institute
API	American Petroleum Institute
ASCII	American Standard Code for Information Interchange
BTS	Bureau of Transportation Statistics
CAD	Computer Aided Drafting
CADD	Computer Aided Drafting and Design
CO2	Carbon dioxide
CRD	Crude oil
DLG	Digital Line Graph
DOE	Department Of Energy
DOT	Department Of Transportation
DXF	Drawing Interchange File or Drawing Exchange File
FERC	Federal Energy Regulatory Commission
FGDC	Federal Geographic Data Committee
FIPS	Federal Information Processing Standards
GIS	Geographic Information System
GPS	Global Positioning System
HG	Hydrogen gas
HVL	Highly volatile liquid
INGAA	Interstate Natural Gas Association of America
LNG	Liquefied Natural Gas
LPG	Liquefied Petroleum Gas
MQAT	Joint Government-Industry Pipeline Mapping Quality Action Team
NAD 27, 83	North American Datum (of 1927 or 1983)
NG	Natural gas
NGL	Natural gas liquids
NPMS	National Pipeline Mapping System
OMB	Office of Management and Budget
OPS	Office of Pipeline Safety
PRD	Product
ROW	Right-Of-Way
RSPA	Research and Special Programs Administration
SQL	Structured Query Language
USGS	United States Geological Survey

## Glossary of Pipeline GIS-Related Terms

Accuracy	The degree of conformity with a recognized or established standard.
Accuracy (absolute)	The accuracy of a map in representing the geographic location of an object relative to its true location on the surface of the earth. Absolute accuracy is based on geographic coordinates.
Accuracy (relative)	The accuracy of a map in representing the geographic location of an object relative to the locations of other objects.
Aerial photo	Photograph of part of the earth's surface taken by an aircraft-supported camera.
Alignment sheets	A general purpose drawing designed to be used by company personnel during the operation and maintenance of the pipeline.
Alphanumeric	Consisting of both letters and numbers, as well as some punctuation symbols.
Area	A generic term for a bounded, continuous, two-dimensional object that may or may not include its boundary.
ASCII	<u>American Standard Code for Information Interchange</u> . A popular standard for the exchange of alphanumeric data.
Attribute	Characteristic that help describe the data.
Base map	A map containing visible surface features and boundaries that is used for local reference.
Benchmark	A point of known location used as a reference point.
CAD or CADD	<u>Computer Aided Drafting (CAD) and Design (CADD)</u> - an automated system for the drafting and display of graphic oriented information.
Control point	A point of known vertical elevation and/or horizontal position.
Conversion	The process of transforming information from one form to another, i.e. analog (paper) data into digital data.
Coordinates	Pairs of numbers expressing horizontal distances along orthogonal axes.
Crude oil	Liquid petroleum as it comes out of the ground, as distinguished from refined oils manufactured out of it.
Database	Structured collection of data defined for a particular use, user, system, or program; it may be sequential, network, hierarchical, relational, or semantic.
Data capture	Process of converting hard copy maps into a digital format.
Data dictionary	A listing of each data field and a definition or description of what is contained in that field.
Data set	A collection of related data.
Datum (geodetic)	Level surface to which elevations are referenced, such as mean sea level; frame of reference for measuring a location on the surface of the earth.
Digital	The discrete numerical representation of data.
Digital centerline	Series of connected data elements representing the pipeline.
Digital orthophotos	A digital image of an aerial photograph in which the displacement caused by the camera tilt and by terrain have been corrected.
Digitize	The process of converting hard copy manual drawings into digital format.
Display	A computer monitor screen or image produced on the screen.
DLG	<u>Digital Line Graphs</u> - digitized data from USGS base map categories, including transportation, hydrology, elevation contours, and public land survey boundaries.
Domain	Identifies valid values for a metadata element.
DXF	<u>Drawing eXchange Format</u> - a graphic file and data interchange standard.
Facilities	Parts of the pipeline system, such as the pipe, valves, compressor stations, etc.
FGDC	<u>Federal Geographic Data Committee</u> - established through OMB and charged with coordinating the development, use, sharing, and dissemination of geographic data.
File	A collection of records (data) treated as a unit.
Format	How the information is stored - paper, electronic, or digital.
Free date	Calendar date specifying one of the following:

1. Year (formatted YYYY)

2. Year and month (formatted YYYYMM)

3. Year, month and day (formatted YYYYMMDD)

Free real	Numbers with decimal places that describe the individual data element.
Free text	Words or numbers that describe the individual data element.
Geodetic control	Surveying and monumental points on the earth's surface whose location is established in accordance with national standards.
Geographic	Referring to coordinate systems, latitude/longitude or comparable geographic grid location reference.
Geospatial data	Information that identifies the geographic location and characteristics of natural or constructed features and boundaries on the earth.
GIS	<u>Geographic Information System</u> - computer hardware, software, geographic data used to capture, store, update, maintain, analyze, and display graphically referenced information.
GPS	<u>Global Positioning System</u> -survey instrument/process using satellite generated timing data to establish either ground or aerial coordinates.
Graphic element	Points, lines, arcs, symbols, etc., that are displayable.
Hardcopy	A permanent image such as a plot or printout.
Hardware	The physical components of the computer system or network such as the computer, printer, plotter, and terminal.
Hazardous liquid	Petroleum, petroleum products, or anhydrous ammonia.
Highly volatile liquid	Also referred to asHVLs. A hazardous liquid that will form a vapor cloud when released to the atmosphere and has a vapor pressure exceeding 76Pa (40 psia) at 37.8 (100 F) Note: natural gas liquids are alsoHVLs .
Interstate	A pipeline or part of a pipeline that is used in the transportation of natural gas, hazardous liquid, or carbon dioxide in interstate or foreign commerce.
Latitude	Distance measured north or south of the equator.
Liquefied Natural Gas	Also referred to as LNG. Natural gas that has been cooled to about -160 degrees Centigrade for storage or shipment as a liquid.
Liquefied Petroleum Gas	Butane and propane separated from natural gasoline and sold in liquid form as fuel. Commonly referred to as bottled gas, tank gas, or simply LPG.
Longitude	Distance measured east or west from a reference meridian (usually Greenwich).
Map	A spatial representation, usually graphic on a flat surface, of spatial phenomena.
Media	The physical devices used to record, store, or transmit data.
Metadata	Documented descriptions of the information, such as the timeliness of the data, attribute sources, accuracy of the data, etc.
MQAT	<u>Mapping Quality Action Team</u> . Sponsored by OPS, API, and AGA/INGAA.
NAD 27, 83	<u>North American Datum</u> (of 1927 or 1983) - two mathematical representations of the surface of the earth.
Natural Gas Liquids	Also referred to asNGLs. Can be ethane, butane, propane, or a propane-butane mix.
NPMS	<u>National Pipeline Mapping System</u> - a pipeline database that will indicate the location, commodity, operator, and contact person for transmission pipelines and LNG facilities operating in the United States.
One-Call	Service to notify underground utilities of planned excavations.
Operator	A person who owns or operates a pipeline and engages in the transportation of gas.
Orthophoto	Photo with camera tilt and relief displacements removed, resulting in a scale-correct image.
Overlay	Simultaneously viewing two or more digital data sets of similar geographic areas.
Pipeline/pipeline system	All parts of those physical facilities through which gas or hazardous liquid moves in transportation.
Point	A zero dimensional object that specifies geometric location. One coordinate pair specifies the location.
Quadrangles (Quads)	Typically refers to the USGS map sheets in the 7.5 minute quad series or the 15 minute quad series. Also known as topographic maps.
Quality	An essential or distinguishing characteristic needed for cartographic data to be fit for use.
Repository	An entity(s) designed to maintain, store, and warehouse data.
ROW	<u>Right-Of-Way</u> - a section of land designated for use by a pipeline.
Scale (large)	Small map area showing greater detail (1:2400).

Scale (small)	Large map area with less detail (1:100,000).
Software	General name for computer programs and programming languages.
Spatial data	Data about the location of objects and their relationship with one another.
SQL	<u>Structural Query language</u> - an ANSI standard high level database language.
Thematic	Depicting particular features or concepts.
Topographic maps	Map showing horizontal and vertical (contours) indicating lines of equal surface elevation.
Topography	Shape of configuration of the land surface. Represented by contour lines in map form.
Topology	Descriptions of geographic relationships of features, especially what features are adjacent to or connected to another feature.
Vector	Data composed of individual coordinate points and lines whose endpoints are defined by coordinate pairs.

# National Pipeline Mapping System (NPMS)

## Standards for Creating Pipeline Location Data

Standards for  
Paper Data Submissions,  
Including  
Metadata Standards  
and Examples

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This document was prepared by the second Joint Government/Industry Pipeline Mapping Quality Action Team (MQAT II). The Team is sponsored by the U.S. Department of Transportation's Office of Pipeline Safety (OPS), the American Petroleum Institute, the American Gas Association, and the Interstate Natural Gas Association of America. Representatives on the Team include OPS, the Bureau of Transportation Statistics (BTS), the Department of Energy (DOE), the U.S. Geological Survey (USGS), the Federal Energy Regulatory Commission (FERC), state representatives from California, Louisiana, New York, and Texas, and representatives from the pipeline industry.

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# Paper Data Submission Standards

## Draft

The paper data submission standards consist of four sections:

1. General Topics
2. Paper Base Maps
3. Attribute Data
4. Metadata (Data Transmittal Forms)

### Section 1 - General Topics

These standards were created with input from the pipeline industry and government agencies. They address the submission of paper maps to support the development of a reasonably accurate National Pipeline Mapping System.

It is the responsibility of the operator to provide a clean paper set that complies with these standards. The operator will not be required to answer any questions, from outside parties, who are contacting the repository with questions or issues regarding the data. The operator will only be required to work with the repository to ensure compliance with the standards and a smooth incorporation of the operator's data into the repository.

The repository will produce check plots after incorporating the operator's paper map(s) and attribute data into the repository. These check plots of the operator's pipeline data will be returned to the operator for review. Only after the operator has reviewed and quality checked the check plots will the data be fully incorporated into the repository. Once the operator's paper map data has been digitally incorporated into the repository, it can be returned to the operator free of charge.

The repository will accept pipeline positional accuracy beyond plus or minus 500 feet. It is anticipated that there will be a greater level of accuracy of data in urban areas. Every pipeline operator that cannot currently provide the 500 foot level of accuracy should be moving towards that goal. Eventually, as the National Pipeline Mapping System evolves, the plus or minus 500 foot accuracy may be required.

These standards represent a guideline for preparing and submitting paper maps and associated attribute data for inclusion in the National Pipeline Mapping System Repository. The repository understands that the availability of pipeline company maps and digital data varies between operators and that there is a need to be flexible in working with the pipeline operators. On a case by case basis, the repository will review and approve variations of data submissions from this standard.

## Section 2 - Paper Base Maps

It is preferred that the data provided by the pipeline operator be in a digital format. If digital data is not available, then paper submission is acceptable. The submitted maps can be original maps or reproductions. **HOWEVER, IF SUBMITTING A REPRODUCTION, THE SUBMITTED MAP WILL NOT BE ACCEPTED IF ITS' SCALE HAS BEEN MODIFIED FROM THE ORIGINAL MAP SCALE.** Additionally, the operator should ensure that the reproduction and submission of any map does not violate existing copyright laws.

### **Acceptable paper base maps:**

U.S. Geological Survey (USGS) Topographic maps, 7.5 minute / 1:24,000 scale. Where 1:24,000 scale maps do not exist (i.e., Alaska, Puerto Rico, offshore), the operator should use the largest scale USGS maps available.

- **NOTE:** Pipeline inventory sheets or route maps are NOT acceptable. Although these maps are typically created at a large scale, their underlying base map is usually not created from a real world coordinate system. Therefore, these maps are very difficult and impractical to use in developing a National Pipeline Mapping System.

### **Plotting pipeline location on paper base maps:**

The location of every in-service gas transmission pipeline (as defined by the U.S. Department of Transportation), liquid trunk pipeline, or liquefied natural gas facility operated by your company(s) must be reflected on the base map(s). The operator has two options for reflecting the pipelines they operate on the base maps:

- Designate individual pipelines on the maps. (Preferred method)
- Designate pipeline right-of-ways with the number of pipelines operated in each right-of-way.

When submitting either an original or a black and white copy map, the operator should draft a thin solid line that clearly delineates the location of the pipeline(s) or pipeline right-of-way. In order to make the lines more identifiable for the repository, the operator should use a maker to highlight the drafted lines. If there are multiple pipelines or pipeline right-of-ways on the same map, the operator should use different color markers to make them distinguishable. This will allow the repository to clearly identify the pipeline(s) you submit from roads and other pipelines that exist on the original base map.

Based on the operator's naming convention for their pipelines, each pipeline should be uniquely identified on the map with a Facility ID. The Facility ID is defined as the FACIL\_ID in the attribute file. The FACIL\_ID is a twenty character alpha-numeric tag that provides a unique identifier for the pipeline. This Facility ID must be unique and constant to each pipeline or pipeline segment, i.e. the same identifier "128-000" or "Amarillo 1" cannot be utilized on two different pipelines in different geographic areas.

The Facility ID must be used to reflect the beginning and end of each section of pipeline that has different data attributes. See the Attribute Data section of this standard for more detailed information.

**Individual pipelines (preferred method):**

The operator should ensure that the positional accuracy of the drafted pipeline is plus or minus 500 feet of the pipeline centerline. The repository and operator acknowledge that the positional accuracy may vary based on the original survey data, existing paper maps, and other variables. The operator should evaluate the positional accuracy of the data and document the value in the Metadata file (see the Metadata section of this standard).

**Pipeline right-of-ways:**

The operator is allowed the option of submitting on the base map, one graphic line representing the location of multiple pipelines in a right-of-way. An attribute record should be submitted for each pipeline within the pipeline right-of-way. The operator should ensure that the positional accuracy of the right-of-way center is plus or minus 500 feet. The repository and operator acknowledge that the positional accuracy may vary based on the the original survey data, existing paper maps, and other variables. The operator should evaluate the positional accuracy of the data and document the value in the Metadata File (see the Metadata section of this standard).

**LNG facilities:**

The location of every active LNG facility operated by your company(s) must be reflected on the base map(s). The operator should designate the approximate geographic center of the LNG facility by plotting a small square and identifying the Facility ID on the map. The Facility ID is defined as the FACIL\_ID in the attribute file. The FACIL\_ID is a twenty character alpha-numeric tag that provides a unique identifier for the LNG facility. This Facility ID must be unique and constant to each LNG facility, i.e. the same identifier "54879" or "Facility 12" cannot be utilized on two different LNG facilities in different geographic areas. The LNG facility's positional accuracy should be plus or minus 500 feet of its' known geographic location. The repository and operator acknowledge that the positional accuracy may vary based on the original survey data, existing paper maps, and other variables. The operator should evaluate the positional accuracy of each LNG facility and document the value in the Metadata file (see the Metadata section of this standard).

The operator must identify the number of pipelines within each right-of-way and list a separate Facility ID for each of the pipelines. A separate attribute record should be submitted for each of the identified pipelines.

### **Section 3 - Attribute Data**

The operator is required to provide descriptive data about the pipelines and/or LNG facilities when submitting maps to the repository. Data can be provided by entering the data into the repository provided spreadsheet template, the preferred option, or in ASCII fixed length format. The submitted data must meet the defined format. Submitted data items that exceed the data length limits will be truncated. For example, the operator can submit a FACIL\_ID that is up to, but not more than, twenty characters in length and an OPER\_NAME that is up to, but not more than, forty characters in length.

The "Required for" columns identify whether the field is either mandatory or optional for pipeline and LNG records.

## Data Submission - Paper Maps

### Attribute Information File

Field Name	Field Type	Field Length	Short Description	Description	Domain	Required for Pipeline	Required for LNG
OPS_CODE	C	5	OPS Code	Number assigned by OPS to the company that physically operates the pipeline and its' facilities.	Alpha/Numeric	Y	Y
OPER_CO_ID	C	12	Operator Code	Assigned by Operator, unique identifier for a pipeline company. May be the same as the OPS code. Used if operator requires additional company identification beyond the OPS code; possibly the DUNS number for the Operator.	Alpha/Numeric	Y	Y
OPER_NAME	C	40	Operator Name	The company that physically operates the pipeline and its' facilities.	Alpha/Numeric	Y	Y
FACIL_ID	C	20	Pipeline or LNG ID	Assigned by Operator, a unique identifier for each pipeline or LNG facility.	Alpha/Numeric	Y	Y
FACIL_NAME	C	40	Pipeline or LNG Name	Assigned by Operator, a unique name for each Pipeline or LNG facility. May be up to forty (40) characters.	Alpha/Numeric	Y	Y
FACIL_SUB_NM	C	40	Pipeline or LNG Subsystem Name	Assigned by Operator, a name for a logical grouping of Facility ID's (pipelines or LNG facilities). Optional field that, when used by the operator, allows for a database query of a group of pipelines or LNG facilities.	Alpha/Numeric	N	N
COMMODITY1	C	3	Commodity Category 1	An abbreviation for the primary commodity carried in the pipeline. NG=natural gas, CRD=crude oil, HVL=highly volatile liquid, LNG=liquefied natural gas, LPG=liquefied petroleum gas, PRD=product, AA=anhydrous ammonia, CO2=carbon dioxide, HG=hydrogen gas, NGL=natural gas liquids.	NG, CRD, HVL, LNG, LPG, PRD, AA, CO2, HG, NGL	Y	Y
COMMODITY2	C	3	Commodity Category 2	An abbreviation for the secondary commodity carried in the pipeline. NG=natural gas, CRD=crude oil, HVL=highly volatile liquid, LNG=liquefied natural gas, LPG=liquefied petroleum gas, PRD=product, AA=anhydrous ammonia, CO2=carbon dioxide, HG=hydrogen gas, NGL=natural gas liquids.	NG, CRD, HVL, LNG, LPG, PRD, AA, CO2, HG, NGL	N	N
COMMODITY3	C	3	Commodity Category 3	An abbreviation for the additional commodities carried in the pipeline. NG=natural gas, CRD=crude oil, HVL=highly volatile liquid, LNG=liquefied natural gas, LPG=liquefied petroleum gas, PRD=product, AA=anhydrous ammonia, CO2=carbon dioxide, HG=hydrogen gas, NGL=natural gas liquids.	NG, CRD, HVL, LNG, LPG, PRD, AA, CO2, HG, NGL	N	N
CMDTY_DESC	C	40	Commodity Description	Assigned by the Operator, a description field for additional information on commodities carried.	Alpha/Numeric	N	N
INTERSTATE	C	1	Interstate	(Y)es/ (N)o designator to identify if pipeline is an interstate or intrastate pipeline. Y=Interstate	Upper case Y/ N	Y	N
STATUS_CD	C	1	Status Code	A designator identifying the status of the pipeline or LNG facility. (A)ctive, (I)nactive, a(B)andoned, (R)etired, and (S)old. Note: B, R, and S are for revisions, not for new submittals	A, I, B, R, S	Y	Y
QUALITY_CD	C	1	Quality Code	Operator's estimate of the positional accuracy of the pipeline. (4): within 50 feet, (3): within 50 to 300 feet, (2): within 300 to 500 feet, (1): within 500 to 1000 feet; (0): Unknown.	4, 3, 2, 1, 0	Y	Y
REVISION_CD	C	1	Revision Code	Designates if this is a data addition, a modification, or a deletion. (A)dd, (M)odify, (D)elete	A, M, D	Y	Y
DATE	C	8	Date Stamp	Date of the change in REVISION_CD. (Year Month Day)	YYYYMMDD	Y	Y
META_NAME	C	12	Metadata Name	Link to the Metadata file (standard file name 8.3, see Metadata standards).	File name	Y	Y

NOTE: "C" is for character data.

## **Section 4 - Metadata (Data Transmittal Form)**

Please refer to the following Metadata standards for detailed information on metadata submissions.

The operator must link every attribute data record to a metadata file. The operator will provide in the metadata file:

- Descriptive information that will be used to answer questions about the submitted data.
- An estimate of the pipeline positional accuracy.
- Identification of source documents utilized.
- Contact information to be used only by the repositories.

An operator may have one or more metadata files, depending on how much the above items vary in relation to the attribute data. The repository will add to the operator's submitted metadata file, any applicable metadata information that results from the digitizing of the submitted map data.

# Metadata Standards for Paper Data Submissions

## Draft

### Overview

**The definition of metadata is simply “data about data.”** Metadata describes the content, quality, condition, and other characteristics of the data. Metadata helps a person locate and understand the data. Think of it as a candy wrapper around data. If you take the time to read the wrapper, you will learn a great deal about the data underneath. In the process of building a National Pipeline Mapping System, metadata plays an important role:

1. Metadata allows operators and the repository(s) to organize and maintain the major investment in this data, made by both pipeline companies and government agencies. As personnel change or time passes, information about pipeline data could be lost. Later, individual pipeline companies and repository users may not understand the content and uses of the original paper data and find they can't trust results generated from the digitally converted data. Complete metadata descriptions of the content and accuracy of the data will encourage appropriate use of the data.
2. Metadata provides a means for researching the data. Few operators and government agencies can afford to create all of the data they need. By making the metadata available through the repository(s) and other clearinghouses, pipeline operators and others can review metadata information to find appropriate data.
3. Metadata provides information to aid in the transfer of data. Metadata should always accompany the transfer of a data. The metadata will aid the entity receiving the data to process, interpret, and correctly incorporate the data into their existing system.

The following “Data Transmittal Form”, when completed, will provide all of the metadata that will be needed from the operator. Example A is a completed Data Transmittal Form that was created for clarification.

## Data Transmittal Form for Paper Submittal

### Operator and Data Description

1. Pipeline operator name:
2. Briefly describe what is contained on the paper map(s):
3. Date when the pipeline and/or LNG information was drawn on the map(s):
4. When was the map(s) last modified?
5. How up-to-date is the pipeline and/or LNG information on the map(s) compared to the actual field conditions?
6. What are the lower left and upper right coordinates (minimum and maximum) of this map(s)? Please provide in decimal latitude /longitude degrees:  
Lower Left Longitude:  
Lower Left Latitude:  
Upper Right Longitude:  
Upper Right Latitude:
7. List places covered by this information (keywords-states, cities, basin(s)):
8. What kind of quality checks did you perform on the attribute data?
9. What kind of quality checks did you perform after drawing the lines and/or points on the map(s)?

10. Is the pipeline and/or LNG facility positional accuracy within (mark only one)?

Less than 50 feet (4)

50 to 300 feet (3)

300 to 500 feet (2)

500 to 1000 feet (1)

Unknown (0)

11. Briefly explain how you determined the positional accuracy value:



## **Contact Information**

### **Technical Information Contact**

Name:

Company:

Mailing Address:

Phone Number:

Fax Number:

E-mail Address:

### **Transmittal Form Contact (if different from technical contact)**

Name:

Company:

Mailing Address:

Phone Number:

Fax Number:

E-mail Address:

## Example A Data Transmittal Form for Paper Submittal

### Operator and Data Description

1. Pipeline operator name: ABC Pipeline Company
2. Briefly describe what is contained on the paper map(s): The map contains two pipelines operated by ABC Pipeline Co. The Western pipeline is highlighted in yellow and the Eastern pipeline is highlighted in light blue.
3. Date when the pipeline and/or LNG information was drawn on the map(s): The pipelines were drafted on the map January 13, 1997.
4. When was the map(s) last modified? After a QC process, one segment of the Eastern pipeline had to be redrawn on February 1, 1997; no other modifications.
5. How up-to-date is the pipeline and/or LNG information on the map(s) compared to the actual field conditions? The pipeline information of the maps represents the field conditions as of the date of our submittal. There are no anticipated changes in the data in the near future.
6. What are the lower left and upper right coordinates (minimum and maximum) of this map(s)?  
Please provide in decimal latitude /longitude degrees:  
  
Lower Left Longitude:            -89.875  
Lower Left Latitude:            30.375  
Upper Right Longitude:        -89.742  
Upper Right Latitude            30.506
7. List places covered by this information (keywords-states, cities, basin(s)):  
Houston, Texas

8. What kind of quality checks did you perform on the attribute data? The attribute database is printed and compared visually for input errors.
9. What kind of quality checks did you perform after drawing the lines and/or points on the map(s)? The line work is QC'ed by visually comparing against the sources.
10. Is the pipeline and/or LNG facility positional accuracy within (mark only one)?
- Less than 50 feet (4)
  - 50 to 300 feet (3)
  - 300 to 500 feet (2)
  - 500 to 1000 feet (1)
  - Unknown (0)
11. Briefly explain how you determined the positional accuracy value: The positional accuracy value is a best estimate based on our survey maps.

### Source Material Description

Note: For the following section, if you have more than one source material, please duplicate this page and complete for each source.

12. What is the name of the organization or individual that created the source material for your paper map(s)? ABC Pipeline Surveying Division
13. What is the date(s) of the source material? 1950 through 1997
14. What is the source material (e.g. a map, GPS data, survey, etc.)? map
15. What is the source material on (e.g. paper, mylar, diskette, cartridge tape, CD-ROM, etc.)? paper
16. How up-to-date is this source material compared to actual field conditions? The source was last modified in February of 1997 and still represents the actual field conditions of the pipeline.
17. Briefly describe how you used the source material to create this paper map(s):  
The source contains the drawings and notes for the pipelines and was used, in conjunction with the aerial photos and the quad sheet, to delineate the pipelines.
18. Is the source in NAD27 (North American Datum) or NAD83? NAD 27

### Source Material Description

Note: For the following section, if you have more than one source material, please photocopy this page and complete for each source.

12. What is the name of the organization or individual that created the source material for your paper map(s)? Al's Air Photo, Inc.
13. What is the date(s) of the source material? 1995
14. What is the source material (e.g. a map, GPS data, survey, etc.)? aerial photography mylar sheets
15. What is the source material on (e.g. paper, mylar, diskette, cartridge tape, CD-ROM, etc.)? mylar
16. How up-to-date is this source material compared to actual field conditions? The source material depicts the actual field conditions at the time the aerial photography was taken.
17. Briefly describe how you used the source material to create this paper map(s):  
The aerial photographs were used to assist in identifying landmarks that appear both on the inventory sheets and the quad sheet. Also by using the photographs, many of the pipeline scars were visible and therefore helped in accurately locating the pipeline during the drafting process.
18. Is the source in NAD27 (North American Datum) or NAD83? NAD83

### Source Material Description

Note: For the following section, if you have more than one source material, please photocopy this page and complete for each source.

12. What is the name of the organization or individual that created the source material for your paper map(s)? U.S. Geological Survey
13. What is the date(s) of the source material? 1993
14. What is the source material (e.g. a map, GPS data, survey, etc.)? map
15. What is the source material on (e.g. paper, mylar, diskette, cartridge tape, CD-ROM, etc.)? paper
16. How up-to-date is this source material compared to actual field conditions?  
Unknown, assuming the maps represent field conditions in the early 1990's. Depends when USGS compiled the data from the original source.
17. Briefly describe how you used the source material to create this paper map(s):  
The quad sheet provided the base for the pipeline locational information. In conjunction with the other sources, it allowed us to more accurately draft the pipeline.
18. Is the source in NAD27 (North American Datum) or NAD83? NAD83

## Contact Information

### Technical Information Contact

Name: Billy Input  
Company: ABC Pipeline Company  
Mailing Address: 1234 The Boss Drive  
Austin, TX 12345  
Phone Number: 555-123-1234  
Fax Number: 555-123-5678  
E-mail Address: input@abcpipeline.com

### Transmittal Form Contact (if different from technical contact)

Name: John Data  
Company: ABC Pipeline Company  
Mailing Address: 1234 The Boss Drive  
Austin, TX 12345  
Phone Number: 555-123-0123  
Fax Number: 555-123-5678  
E-mail Address: data@abcpipeline.com

# Operator Instructions for Submitting Paper Maps to the National Pipeline Mapping System

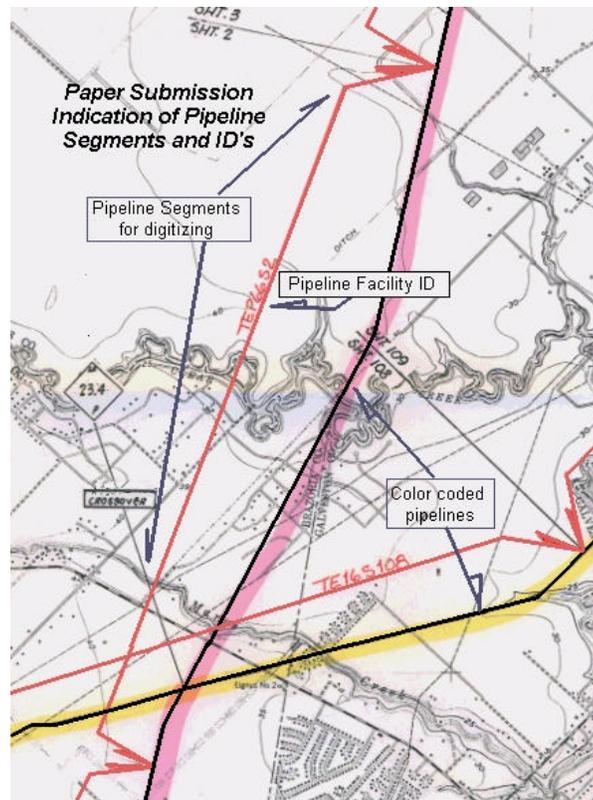
To ensure that maps and associated data for the operator are entered into the National Pipeline Mapping System (NPMS) database with the greatest accuracy and minimized difficulties, please follow these guidelines.

1. The NPMS will be based on decimal latitude/longitude coordinates. Operators are asked to submit their pipeline maps using lat/long, thus ensuring that the NPMS will not erroneously convert state plane or other grid systems and plot the pipelines in the wrong area. Therefore, the NPMS asks that all paper maps be submitted on standard USGS 7.5' quad sheets.
2. Several operators may have more than one pipeline in an area on a quad sheet. The NPMS asks that each pipeline be clearly labeled and highlighted in different colors. The pipeline itself should be drawn on the quad using a thin line to improve the accuracy of the digitizing. The NPMS asks the operators to draft the features on their maps to be within 500 feet accuracy. This accuracy level means that the pipeline, as drawn on the quad, should be within a quarter inch of its actual centerline location.
3. If the operator desires, the pipeline may be broken into segments to better identify the pipeline. These segments must be clearly marked on the quad sheet with a beginning and an ending mark. The operator must clearly label each segment with a unique alpha-numeric code, the Facility ID, to identify each segment.
4. In the margin of each quad sheet, the NPMS asks that the operator build a legend composed of the operator name, names of the various pipelines on the quad, and indicate what color was used to highlight each pipeline. The quads themselves should be numbered by the operator to ensure inclusion of all map sheets.
5. To identify what the pipeline contains, it's status, the operator name, etc., the submitting operator is asked to build a small text file containing the requested attribute data. Send this text file along with the paper maps to the NPMS. See Section 3 - Attribute Data in the Paper Data Submission Standards for additional information.
6. Finally, the NPMS needs some information regarding the maps, annotations, and attributes. They need to know your estimate of accuracy, when was the last time you validated or edited your pipeline data, when was the original survey done, and whether the pipeline has been checked with a GPS. This data is used by the NPMS to give a quality grade to your submitted pipeline and to give agencies that want to look at your data an idea of how old or accurate it is. This file has the label of "metadata" and follows a specific format based on government standards. Operators will be provided with a template to use in generating this metadata file or Data Transmittal Form.

See the Metadata Standards for additional information.

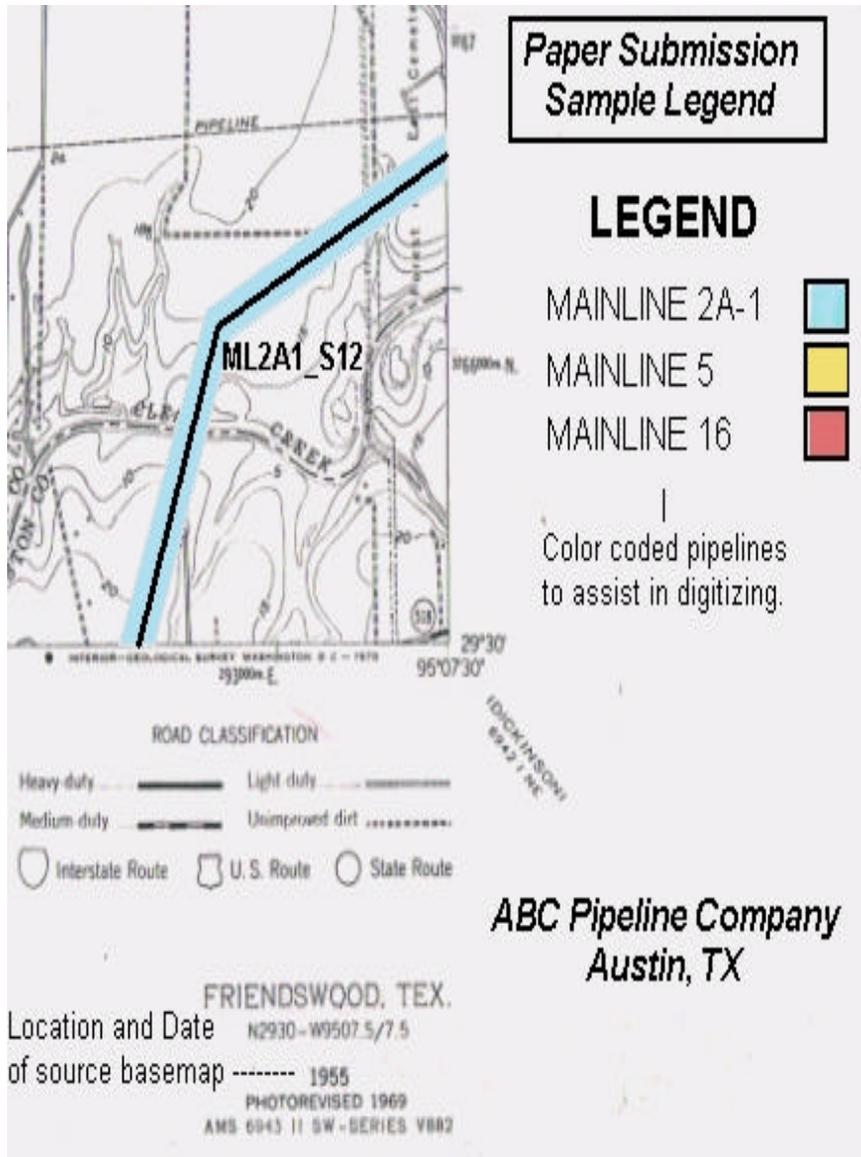
## Sample of a USGS Quad Submitted to the NPMS by an Operator

Notice the highlighting, in different colors, for the two pipelines. Also, this submission contains pipelines that have been further refined into pipeline segments (Facility ID's); the beginning and ending of each segment is clearly identified.



## Sample of a USGS Quad Submitted to the NPMS by an Operator

Notice that the Operator has included a legend on the side of the paper map. The legend is color coded to allow easier interpretation by the NPMS repository.



## Drafting pipelines on the quad sheet

1. Draw a thin solid line for each pipeline on the quad sheet. Draft the line while keeping in mind the 500 foot accuracy request.
2. Color code different pipelines. On the sample, there are two lines owned by the operator on this quad. One pipeline is highlighted in yellow and runs across the map at the bottom in a general southwest to northeast direction. The other pipeline is highlighted in pink and travels vertically through the center of the map from north to south.
3. Each pipeline drafted on the map must have a name that is unique from all other pipelines submitted by the operator. This pipeline name is the 40 character alpha-numeric FACIL\_NAME field in the attribute table. This pipeline name must be the same on all maps that display that pipeline. In the example above, the north-south line has a pipe\_name of "TETCO Mainline P66". The pipeline traveling east-west has a pipe\_name of "TETCO Mainline 16".
4. If the operator chooses, they may divide long pipelines into segments. These segments may be created based on pipeline attributes or as-build page numbers that the operator uses to further identify their pipeline. This segment number is the 20 character alpha-numeric FACIL\_ID field in the attribute table. This is a unique value and cannot be used for any other segment the operator submits to the NPMS. In this sample, the operator divided the pipeline into segments based on page numbers in the operator's as-build books. Divisions may be based on diameter, control areas, station loops, etc., and are entirely optional. The sample line running north-south has been segmented into short lengths marked by begin-end arrows on the pipeline. The sample map has lines with pipe\_id's of TEP66S2 and TE16S108.
5. The operator should build a small legend in the lower right corner of each quad sheet to list the operator's name and the FACIL\_NAME of each line on the map, along with its color code. It is suggested that the quad sheets be sequentially numbered.
6. The quad sheets also contain data that will be used in building the descriptive metadata file. These items are the name of the quad, the publication year, the lower-left and upper-right lat/long values, and the datum year. The datum year, called NAD, is found in the lower left legend and is usually listed with the projection, such as 1927 North American Datum. If possible, the operator should use the more modern quad sheets that have a 1983 North American Datum.

## Building the Attribute Data file

The NPMS asks the operator to submit descriptive data about each pipeline or LNG facility that has been drafted. This descriptive data will be sent to the NPMS as a database file, comma delimited text file, or following the NPMS' fixed column ASCII file format. A single file may be submitted for all of the pipelines the operator is sending to the NPMS.

File elements:

1. **OPS\_CODE** This is a 5 digit character value assigned to all operators by the OPS for fee payments. This number is commonly known to the accounting or pipeline safety person on the operator's staff. Most operator numbers start with 0, for example 09235.
2. **OPER\_CO\_ID** This is a 12 digit character value that the operator generates and uses to further divide pipelines if the OPS\_CODE is insufficient. Major operators may have the same OPS code for several pipeline systems they own. Some operators have used the DUNS number in this field, or have simply entered in the OPS\_CODE again with an extra digit at the end to segregate the pipe. If this field is left blank, the NPMS will copy the OPS\_CODE into this area.
3. **OPER\_NAME** This is the name of the operator who submitted the pipeline. This name must be entered and is a 40 characters or less value, including blanks. This name should match the operator name in the legend on the quad sheets.
4. **FACIL\_ID** The FACIL\_ID is the same identifier that was used to label the pipeline or line segment on the quad. In the sample map, this number would be TEP66S2 or TE16S108. This is the data item that links the attribute file with each graphic element of the map.
5. **FACIL\_NAME** This field is used to label the entire length of a pipeline submitted by the operator. The name is the same for that pipeline on all of the quad sheets and is 40 characters including blanks. In the example, the north-south line has the pipe\_name of "TETCO Mainline P66" and the east-west line has a pipe\_name of "TETCO Mainline 16".
5. **FACIL\_SUBNM** This field is optional. This field may be used by the operator to define sub-systems on the main pipeline. This field is 40 characters including blanks. An example may be: "TETCO Mainline 16, Hastings Loop", and "TETCO Mainline 16, McCallen Loop" to describe subsystems on the TETCO mainline.
6. **COMMODITY1** This first commodity field is required by the NPMS to identify the most common commodity transported through the pipeline. One of several codes, such as NG for natural gas and CRD for crude, should be entered into this 3 character field. **COMMODITY2** and **COMMODITY3** may be used by operators that ship more than one product through their pipeline. The operator should select the most common product for commodity1 and

- then lesser products for 2 and 3.
7. **CMDTY\_DESC** This field is optional and may be used the operator to further define products that are transported. For example, a listing of chemicals or phased flow products could be listed here. The maximum length of this field is 40 characters.
  8. **INTERSTATE** This item is a Yes or No field to designate if the submitted pipe is classified as interstate. Enter a "Y" if the pipeline is a DOT classified interstate pipeline and an "N" if it is a DOT classified intrastate pipeline. If the field is blank, NPMS assumes the line is an interstate pipeline.
  9. **STATUS\_CD** This field gives the NPMS a general idea if the pipeline is in service or not. One of several codes must be entered to classify the pipeline as active, inactive, abandoned, retired, and sold. If this field is blank, the NPMS assumes that the line is active.
  10. **QUALITY\_CODE** This field gives the NPMS an idea on the accuracy of the submitted pipeline. One of five values should be used in this field. For the accuracy ranges, use a "0" for unknown, a "1" for within 500 to 1000 feet, a "2" for within 300 to 500 feet, a "3" for within 50 to 300 feet, and a "4" for within 50 feet. If the field is left blank, the NPMS assumes the pipeline accuracy is Unknown.
  11. **REVISION\_CD** This field tells the NPMS if the operator is submitting the pipeline information for the first time or if submitting corrections to previous maps. One of several codes are used in this field. If the field is left blank, the NPMS assumes that the submitted data is to be added to the repository.
  12. **DATE** This field contains the date the operator is using as a submission date to the NPMS. The format of this field is YYYYMMDD, i.e.: 19970529.
  13. **META\_NAME** This is the name of the metadata file, in DOS 8.3 format, that the operator has used to save their descriptive Data Transmittal Form. For example, "TETCOP66.TXT" would hold the metadata for the TETCO Mainline P66.