**US Army Corps
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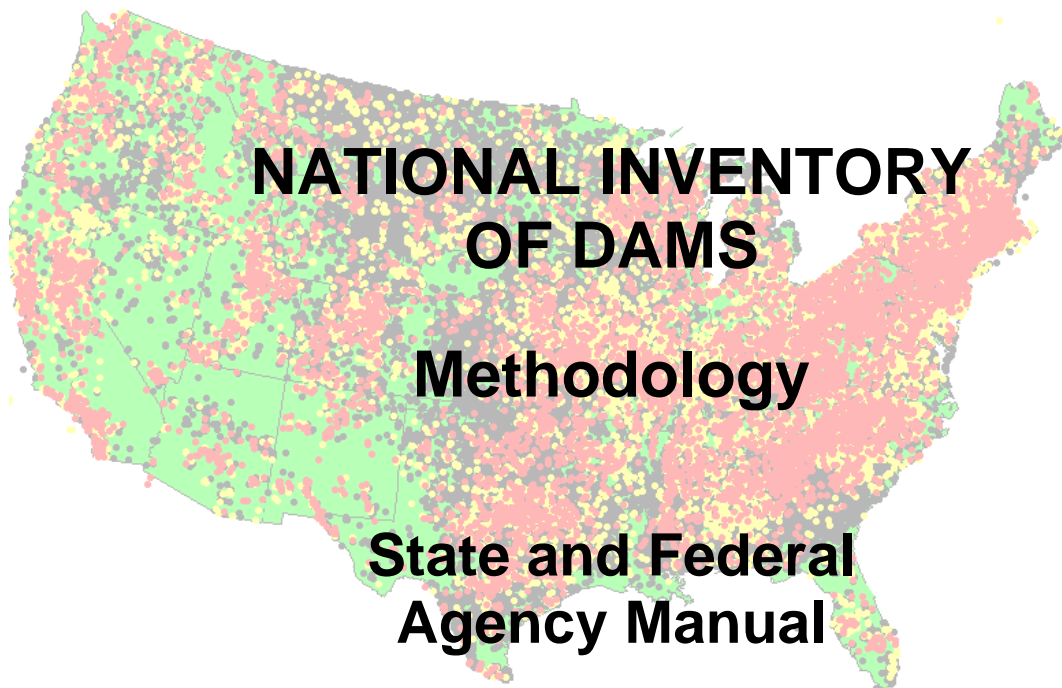
NATIONAL INVENTORY
OF DAMS

Methodology

State and Federal
Agency Manual

Version 4.0
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**Headquarters, U.S. Army Corps of Engineers,
Civil Works Engineering Division**

Association of State Dam Safety Officials

U.S. Army Topographic Engineering Center

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1. INTRODUCTION

With the National Dam Inspection Act (P.L. 92-367) of 1972, Congress authorized the U.S. Army Corps of Engineers (USACE) to inventory dams located in the United States. The Water Resources Development Act of 1986 (P.L 99-662) authorized USACE to maintain and periodically publish an updated National Inventory of Dams (NID). The Water Resources Development Act of 1996 (P.L. 104-303), Section 215, reauthorized periodic update of the NID by USACE, and continued a funding mechanism. The National Dam Safety and Security Act of 2002 (P.L. 107-310) reauthorized the National Dam Safety Program and included the maintenance and update of the NID by the Corps of Engineers. The most recent Dam Safety Act of 2006 reauthorized the maintenance and update of the NID and required this inventory to include available information assessing each dam based on inspections.

The current NID is the result of this evolutionary process. The USACE continues to work closely with the Association of State Dam Safety Officials (ASDSO), FEMA, and other state and federal agencies to update and publish the NID. The success of the NID maintenance and publication program can be attributed to the cooperative participation of the 50 states and Puerto Rico (as facilitated by ASDSO), and 17 federal offices, who provide information on approximately 82,000 dams currently in the NID. The National Dam Safety Review Board (NDSRB) created a subcommittee to advise USACE on the update of the NID. The NID Subcommittee provides guidance and recommendations concerning the data elements, format, and publication media for the NID. Its membership consists of representatives of non-federal and federal agencies who participate in the NID.

The Corps of Engineers and ASDSO are continuously improving the process of inventory data collection and transmission by the states and federal agencies to take advantage of current technology. Software tools were developed to improve the process of managing, inputting, and transmitting NID data. The Dam Safety Program Management Tool (DSPMT) is available for all states and federal agencies to use for submitting their data to the NID. In 2002, 27 states and 6 federal offices used the DSPMT to electronically submit their local inventory data to the NID. In 2003, a quality assurance tool was developed to assist in the NID publication process. The Corps uses NIDChecks to QA/QC the incoming data and resolve duplicate dam submittals. During the 2005-2006 update of the NID, 35 states and 3 federal offices utilized the DSPMT to electronically submit their NID information.

The DSPMT is the preferred method of data collection. Users should be certain they have at least DSPMT Software 2.318, Dated 14 April, 2008, which can be downloaded from www.safedams.org or by contacting TEC. TEC will accept other data formats on CD, through e-mail or ftp but NID submitters will have access to more quality checking by using the DSPMT. Using the DSPMT will ensure a more correct and complete submittal by the agency.

The objectives of the program to update the NID are:

- Update the Dam Inventory data with information from the states and federal agencies.
- Foster state self-sufficiency through assistance for states to maintain and update their own inventory systems, and transfer the information to the National Inventory.
- Obtain participation of all states in the National Inventory.
- Maintain state control of information they submit.

Points of Contact

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Association of State Dam Safety Officials	Lori Spragens (859) 257-5140
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Technical Assistance:

U.S. Army Topographic Engineering Center	Rebecca Ragon (703) 428-6820
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All updated data for the NID should be submitted to TEC. Note that data submissions using the DSPMT software are preferred although other data formats on electronic or mailed media can also be submitted. Technical assistance in data compilation and transmission is also available from Mrs. Ragon or Mr. Grounds, Mon - Fri, 9 AM – 4 PM, EDT.

2. OVERVIEW

This manual discusses the technical steps that can be followed to successfully transmit data from state or federal dam inventories to update the National Inventory of Dams (NID). In each case, the objective is to extract specific information from a state or federal agency inventory database; properly organize that information for transmission to the national inventory; and transmit that information to the U.S. Army Topographic Engineering Center (TEC) for integration into the updated national inventory database.

Following receipt of the data, TEC will compare the data with the previous database submissions, run routines to check for certain types of errors and omissions of required data, and send data verification reports to each office to identify errors or inconsistencies. The states and federal agencies will make revisions, as needed, and send the final data to TEC, followed by publication of the updated NID.

Each of these steps is discussed in a separate chapter of the Manual, as follows:

Chapter 3 NID INCLUSION CRITERIA
Chapter 3 explains the NID Inclusion Criteria and details the height and storage requirements. The DSPMT software allows the user to import all dams then submit only the dams that meet the NID inclusion criteria.

Chapter 4 CANDIDATE SUBMITTAL: FILE STRUCTURE AND LIST OF FIELD DEFINITIONS
Chapter 4 reviews the structure of the Candidate Submittal file, including the field definition for each of the requested inventory items. There are several new fields of information being collected during the 2008 NID Update. The new fields and their definitions are explained in Chapter 4. All new dams must be assigned NID identification numbers by the state dam safety agency. All data submitters will want to refer to this chapter for the definitions and codes of the NID fields.

Chapter 5 DATA PREPARATION
The organization of the data is presented in Chapter 5, including the order, type, and allowable characters for the NID fields. Nineteen of the data fields require use of specific codes. Suggested methods for compiling the data and producing the Candidate Submittal are also presented, including the use of the Dam Safety Program Management Tool (DSPMT) software and other commercial database management software. TEC strongly encourages all agencies to use the DSPMT software to prepare their NID submittal. More information regarding the DSPMT software, including download instructions, can be found in this chapter. Suggested data compression routines to enable more efficient data transmission for non-DSPMT users are also discussed.

Chapter 6 TRANSMISSION METHODS
Chapter 6 reviews the various methods available to send the converted Candidate Submittal to TEC. Using the DSPMT to transmit data is the preferred method. Electronic transfer via e-mail or File Transfer Protocol (FTP) are preferred, since these are the quickest methods. Note that the rapid file exchange possible with these Internet-based methods could enable more effective technical assistance from TEC. However, if electronic transfer is not feasible, common hard media, such as CDs, may be utilized. All NID participants can check the submittal status on www.safedams.org.

Chapter 7 NID COVER LETTER PREPARATION

Along with each Candidate Submittal, certain additional information will be necessary to ensure proper handling of the data by TEC, including both personnel contact information as well as technical details concerning the organization's data and transmittal file. A cover letter with such information is needed from each submitting office, and Chapter 7 reviews the items required and includes a template for the letter. DSPMT users create this letter automatically as part of the NID submittal process. If not using the DSPMT, the cover letter can be transmitted in digital form through electronic or common hard media, or through paper copy.

3. NID INCLUSION CRITERIA

Federal law and the ASDSO Model State Dam Safety Program define a dam as "any artificial barrier, including appurtenant works, which impounds or diverts water, and which (1) is twenty-five feet or more in height from the natural bed of the stream or watercourse measured at the downstream toe of the barrier, or from the lowest elevation of the outside limit of the barrier, if it is not across a stream channel or watercourse, to the maximum water storage elevation; or (2) has an impounding capacity at the maximum water storage elevation of fifty acre-feet or more.

This definition does not apply to any such barrier which is not in excess of six feet in height, regardless of storage capacity or which has a storage capacity at maximum water storage elevation not in excess of fifteen acre-feet, regardless of height, (PL 92-367; Dam Safety Act of 1972) unless such barrier, due to its location or other physical characteristic, is likely to pose a significant threat to human life or property in the event of its failure." (PL 99-662, Water Resources Development Act of 1986).

Criteria for dams in the NID is as follows:

      (1) All high hazard potential classification dams (see Chapter 4 for definition).

      (2) All significant hazard potential classification dams (see Chapter 4 for definition).

      (3) Low hazard or undetermined potential classification dams which

- Equal or exceed 25 feet in height and which exceed 15 acre-feet in storage, or
- Equal or exceed 50 acre-feet storage and exceed 6 feet in height.

Unrecognizable, illogical, or absent data for downstream hazard potential classification, dam height, or storage could result in exclusion of the dam from the NID.

4. CANDIDATE SUBMITTAL FILE STRUCTURE AND LIST OF FIELD DEFINITIONS

INTRODUCTION

"Candidate Submittal" is the name given to the database management file, that each state or federal agency will design as the first step in the process of transmitting information to the National Inventory Of Dams (NID). The Candidate Submittal is designed to consolidate the requested inventory items in a manner consistent with the requirements of the national inventory.

This chapter discusses the standard file structure and includes a list of the field definitions used in the NID. The standard file structure is an ordered listing of specified field labels including the type of data. The field definition listing provides additional information, with specific guidelines on each data entry item.

CANDIDATE SUBMITTAL FILE STRUCTURE

Sixty fields are specified for use in the update of the national inventory, including alphanumeric, numeric and date fields. *Table 1, Candidate Submittal File Structure* provides an overview of the standardized file structure developed for the NID. Additional fields, such as NID Height, NID Storage, State Regulated Dam, State, Source Agency, Submit Date, and Congressional District, will be added by TEC for the published NID. The DSPMT software calculates NID Height and NID Storage before the Candidate Submittal is sent to TEC.

NID *alphanumeric fields* can use any type of printable characters, including letters, numbers, symbols and blank spaces. However, quotation marks and commas should not be used as part of an individual dam entry item, since these characters are sometimes used in delimited text files to separate fields. Use of these symbols in the data entry could cause misinterpretation of the data. Data coordinators should ensure that the specified separators for multiple entries in a field are used.

NID *numeric fields* consist only of numbers. Data, however, may be given as either integer values or as decimal values. If decimal values are used, the decimal point must be included as part of the data entry.

Two *date fields* have been requested for the NID (Inspection Date and Condition Assessment Date). Data coordinators must transmit the date using the mm/dd/yyyy format (04/20/2008). The DSPMT software includes the capability to convert all dates into the NID-required mm/dd/yyyy format.

Table 1, Candidate Submittal File Structure, represents the standard file structure for the NID. The order, field labels, and standard field types are specified for each dam inventory data item.

FIELD #	FIELD LABEL	FIELD TYPE
1	Dam Name	Alphanumeric
2	Other Dam Name(s)	Alphanumeric
3	Dam Former Name	Alphanumeric
4	State or Federal Agency ID	Alphanumeric
5	NID ID	Alphanumeric
6	Number Separate Structures	Number
7	Other Structure ID	Alphanumeric
8	Longitude	Number
9	Latitude	Number
10	Section, Township, Range Location	Alphanumeric
11	County	Alphanumeric
12	River or Stream	Alphanumeric
13	Nearest City/Town	Alphanumeric
14	Distance to Nearest Downstream City/Town (Miles)	Number
15	Owner Name	Alphanumeric
16	Owner Type	Alphanumeric
17	Dam Designer	Alphanumeric
18	Non-Federal Dam on Federal Property	Alphanumeric
19	Dam Type	Alphanumeric
20	Core	Alphanumeric
21	Foundation	Alphanumeric
22	Purposes	Alphanumeric
23	Year Completed	Number
24	Year Modified	Alphanumeric
25	Dam Length (Feet)	Number
26	Dam Height (Feet)	Number
27	Structural Height (Feet)	Number
28	Hydraulic Height (Feet)	Number
29	Maximum Discharge (Cubic Feet Per Second)	Number
30	Maximum Storage (Acre-Feet)	Number
31	Normal Storage (Acre-Feet)	Number
32	Surface Area (Acres)	Number
33	Drainage Area (Square Miles)	Number
34	Downstream Hazard Potential	Alphanumeric
35	Emergency Action Plan	Alphanumeric
36	Inspection Date	Date
37	Inspection Frequency	Number
38	Condition Assessment	Alphanumeric
39	Condition Assessment Detail	Alphanumeric
40	Condition Assessment Date	Date
41	Spillway Type	Alphanumeric
42	Spillway Width	Number
43	Outlet Gates	Alphanumeric
44	Volume of Dam (Cubic Yards)	Number
45	Number of Locks	Number
46	Length of Locks (Feet)	Number
47	Lock Width	Number
48	Permitting Authority	Alphanumeric
49	Inspection Authority	Alphanumeric
50	Enforcement Authority	Alphanumeric
51	State Jurisdictional Dam	Alphanumeric
52	State Regulatory Agency	Alphanumeric
53	Federal Agency Involvement in Funding	Alphanumeric

54	Federal Agency Involvement in Design	Alphanumeric
55	Federal Agency Involvement in Construction	Alphanumeric
56	Federal Agency Involvement in Regulatory	Alphanumeric
57	Federal Agency Involvement in Inspection	Alphanumeric
58	Federal Agency Involvement in Operation	Alphanumeric
59	Federal Agency Owner	Alphanumeric
60	Federal Agency Involvement - Other	Alphanumeric

Table 1, Candidate Submittal File Structure. Only the state dam safety offices provide information in field #48-52. The Federal Agency codes in Table 1B are used for field #53-60.

FEDERAL AGENCY CODE TABLE

Federal Agency Name	Federal Agency Code
Department of Agriculture:	
Natural Resources Conservation Serv	USDA NRCS
Formerly Soil Conservation Serv (SCS)	
Forest Service	USDA FS
Rural Housing Service	USDA RHS
Formerly Farmers Home Loan	
Department of Defense:	
US Army Corps of Engineers	CE
US Army	DOD USA
US Navy	DOD USN
US Air Force	DOD USAF
Department of Interior:	
Bureau of Reclamation	DOI BR
Bureau of Indian Affairs	DOI BIA
Bureau of Land Management	DOI BLM
Fish and Wildlife Service	DOI FWS
Geological Survey	DOI GS
National Park Service	DOI NPS
Department of Labor:	
Mine Safety and Health Administration	DOL MSHA
Department of State:	
International Boundary and Water Commission	IBWC
Department of Energy	DOE
Federal Energy Regulatory Commission	FERC
Nuclear Regulatory Commission	US NRC
Tennessee Valley Authority	TVA

Table 1B, Federal Agency Code Table. The codes are used for Federal Agency Submittal only (field #53-60).

THE NID FIELD DEFINITION: FOUR PARTS

There are 60 fields included in the NID (48-52 are for state dam safety offices only and 53-60 are for federal agencies only). The definition for each field consists of four parts:

- A *field number* indicating the order in which the data is to appear in the Candidate Submittal file.

- The *field label,* indicating the standard name used for each field item, for example, Latitude.

- The *field type,* consisting of alphanumeric, number, or date.

- A *description of the field*, standardizing the information transmitted for individual data items.

The DSPMT software allows users to map their fields into the NID fields and automatically compiles the data into the correct order. A synonym list can also be created to match the submitting agency's codes/descriptors with the NID codes.

LIST OF FIELD DEFINITIONS

The 60 NID field definitions are as follows. The expression included within parenthesis is used to indicate the type of the field. For example, the phrase, "Dam Name (Alphanumeric)" designates an alphanumeric field. The text in red designates a change or addition from the 2005 Methodology Manual.

FIELD DEFINITIONS

(1)   *Dam Name (Alphanumeric)*
      Enter the official name of the dam. Do not abbreviate unless the abbreviation is a part of the official name. For dams that do not have an official name, use the popular name.

(2)   *Other Dam Names (Alphanumeric)*
      If there are names other than the official name (i.e., reservoir name) of the dam in common use, enter the names in this space. Separate the names using a semi-colon. Leave blank if not applicable.

(3)   *Dam Former Name (Alphanumeric)*
      Enter any previous reservoir or dam name(s), if changed. Separate the names using a semi-colon.

(4)   *State or Federal Agency ID (Alphanumeric)*
      Enter the Official State or Agency identification number for the dam.

(5)   *NID ID (Alphanumeric)*
      Enter the official NID identification number for the dam, known formerly as the National ID. This is a required field, and must have an entry for each dam included in the NID. This field is used as the unique identifier for each dam record. The first two characters of the identity are the state two-letter abbreviation, based on the location of the dam. Typically, the last five characters of the identity are a unique number (AB#####); although States are allowed to use alphanumeric combinations in these last five characters.

      The NID ID is the Corps Identification Number that was assigned to each dam in the 1995-96 NID update, under the National Dam Inspection Program (P.L. 92-367). Once assigned, this number should be not changed. However, the following guidelines are provided for assignment of ID numbers for new dams. Each new dam will be assigned an NID ID number by the state dam safety

agency. *NID ID numbers will not be reused.* If a dam is retired or is otherwise not longer in existence, that ID number is retired. The state coordinator is responsible for assigning ID numbers for all dams, regardless of ownership. The numbers may not necessarily be continuous, because of a previously established scheme which assigned certain number ranges to federal agencies. Continued use of this numbering scheme for new dams is at the discretion of the state coordinator. Please contact ASDSO or USACE Dam Safety Team for further information on the process of assigning NID ID numbers or if an alternative number sequence is necessary to meet the needs of the state.

For saddle dams or dikes, please use the NID ID for the main dam. See saddle dam definition in Number Separate Structures Field (listed below).

(6) *Number Separate Structures (Number)*
Enter the number of separate structures associated with this dam project. Include saddle dams (or dikes) as defined in FEMA 148: Federal Guidelines for Dam Safety, Glossary of Terms, as a subsidiary dam of any type constructed across a saddle or low point on the perimeter of a reservoir. Do not include the number of appurtenant works which include, but are not limited to, such structures as spillways, either in the dam or separate there from; the reservoir and its rim; low level outlet works; and water conduits such as tunnels, pipelines or penstocks, either through the dam or its abutments (FEMA Model State Dam Safety Program Glossary of Terms).

(7) *Other Structure ID (Alphanumeric)*
Enter the identification number (S001, S002, etc.) for the saddle dam or dike associated with the larger dam project. This field only applies to saddle dams or dikes. This field is left blank for all other dams.

(8) *Longitude (Number)*
Enter the Longitude at dam centerline as a single value in decimal degrees, NAD83. The DSPMT Merge Utility converts latitude/longitude values into the required decimal degree format. Longitude coordinates should be entered as negative values.

(9) *Latitude (Number)*
Enter the Latitude at dam centerline as a single value in decimal degrees, NAD83. The DSPMT Merge Utility converts latitude/longitude values into the required decimal degree format.

(10) *Section, Township, Range Location (Alphanumeric)*
This is an optional field. If your state tracks the Section, Township, and Range Location on the state database, please enter the information. Enter the information in any form that is understandable and that clearly designates the individual values, i.e. *S21, 73N, R69W.* If the prime meridian location is needed to locate the dam within the state, include it in the field, i.e. *S21, T3N, R68W of 6PM (Sixth Prime Meridian).*

(11) *County (Alphanumeric)*
Enter the name of the county in which the dam is located.

(12) *River or Stream (Alphanumeric)*
The River or Stream designation may be entered in one of two ways. For the convenience of some organizations, an alternative field entry is provided which is consistent with the "tributary and offstream" designations used in the 1995-96 NID. If the alternative form is used, TEC will convert it to the standard form prior to inclusion in the national inventory.

River or Stream Standard Entry: Enter the official name of the river or stream on which the dam is built. If the stream is unnamed, identify it as a tributary to a named river, e.g., *Snake-TR.*   If the dam is located offstream, enter the name of the river or stream plus "-OS", e.g., *Snake-OS.*

River or Stream Alternative Entry: Enter the official name of the river or stream on which the dam is built. If the stream is unnamed, identify it as a tributary to a named river, e.g., *TR-Snake.* If the darn is located offstream, enter the name of the river or stream plus the word, "OFFSTREAM," e.g., *Snake OFFSTREAM.*

(13) *Nearest Downstream City/Town (Alphanumeric)*
Enter the name of the nearest downstream city, town, or village that is most likely to be affected by floods resulting from the failure of the dam.

(14) *Distance to Nearest City/Town (Miles, Number)*
Enter the distance from the dam to the nearest affected downstream city/town/village (listed in the previous field), to the nearest mile (and tenth if appropriate).

(15) *Owner Name (Alphanumeric)*
Enter the name(s) of the dam owner. If multiple owners, list different owners separated by a semi-colon.

(16) *Owner Type (Alphanumeric)*
Enter the *code* to indicate the type of owner:
>   F for Federal;
>   S for State;
>   L for Local Government (defined as have taxing authority or is supported by taxes);
>   U for Public Utility;
>   P for Private.

Codes are concatenated if the dam is owned by more than one type. For example, if the dam is owned by a lake association and a public utility, the owner type would be listed as PU. For multiple owners under the same type, use one code. For example, if multiple individuals own one dam, only list P for private dam ownership.

Some examples of owner types are provided. Local Government should have taxing authority or is supported by taxes. A lake district is supported by taxes and should be entered as Local Government. A lake association is supported by association dues and would not be a Local Government owner type but rather Private owner type.

(17) *Dam Designer (Alphanumeric)*
Enter the name of the principal firm(s) or agency accomplishing design of dam and major appurtenant operating features, and major modifications. List original designer, then modification designers (if applicable). Separate the names using a semi-colon. If an Architect-Engineer Firm designed the dam under a state or federal government contract, list the state or federal agency name first; then the company name second separated by a semi-colon.

(18) *Non-Federal Dam On Federal Property (Alphanumeric)*
Enter the *code* indicating whether this dam is a non-federal dam located on federal property:
>   Y for Yes;
>   N for No.

(19) *Dam Type (Alphanumeric)*

Enter one or more of the following *codes*, in order of importance, to indicate the type of dam:
    RE for Earth;
    ER for Rockfill;
    PG for Gravity;
    CB for Buttress;
    VA for Arch;
    MV for Multi-Arch;
    RC for Roller-Compacted Concrete;
    CN for Concrete;
    MS for Masonry;
    ST for Stone;
    TC for Timber Crib;
    OT for Other.

Codes are concatenated if the dam is a combination of several types. For example, the entry *CNCB* would indicate a concrete buttress dam type.

(20) *Core (Alphanumeric)*

Enter the *code* to indicate the position, type of watertight member and certainty,

Position:	F for upstream facing;
	H for homogeneous dam;
	I for core;
	X for unlisted/unknown;

Type:	A for bituminous concrete;
	C for concrete;
	E for earth;
	M for metal;
	P for plastic;
	X for unlisted/unknown;

Certainty:	K for known;
	Z for estimated;

(21) *Foundation (Alphanumeric)*

Enter the code for the material upon which dam is founded, and certainty:

Foundation:	R for rock;
	RS for rock and soil;
	S for soil;
	U for unlisted/unknown.

Certainty:	K for known;
	Z for estimated.

(22) *Purposes (Alphanumeric)*

Enter *one or more of the following codes* to indicate the current purpose(s) for which the reservoir is used:

> I for Irrigation;
> H for Hydroelectric;
> C for Flood Control and Storm Water Management;
> N for Navigation;
> S for Water Supply;
> R for Recreation;
> P for Fire Protection, Stock, Or Small Farm Pond;
> F for Fish and Wildlife Pond;
> D for Debris Control;
> T for Tailings;
> G for Grade Stabilization;
> O for Other.

The order should indicate the relative decreasing importance of the purpose. Codes are concatenated if the dam has multiple current purposes. For example, *SCR* would indicate the primary purposes, *Water Supply,* followed by *Flood Control and Storm Water Management,* and then *Recreation.*

(23) *Year Completed (Number)*

Enter the year (four digits) when the original main dam structure was completed. This entry should not be changed when a dam is modified – use field 22 below. If unknown, and reasonable estimate is unavailable, enter "0000".

(24) *Year Modified (Alphanumeric)*

Enter the year (four digits) when major modifications or rehabilitation of dam or major control structures were completed. Major modifications are defined as a structural, foundation, or mechanical construction activity which significantly restores the project to original condition; changes the project's operation; capacity or structural characteristics (e.g. spillway or seismic modification); or increases the longevity, stability, or safety of the dam and appurtenant structures. Entries should be followed by *one of more of the following codes* indicating type of modification:

> S for structural;
> F for foundation;
> M for mechanical;
> E for seismic;
> H for hydraulic;
> O for other.

Up to ten modifications can be entered, separated by semicolons.

(25) *Dam Length (Feet, Number)*

Enter, in feet, the length of the dam, which is defined as the length along the top of the dam. This also includes the spillway, powerplant, navigation lock, fish pass, etc., where these form part of the length of the dam. If detached from the dam, these structures should not be included.

*** Because the "height of dam" definition used by each of the participating State and Federal agencies varies, three different height fields are provided in the NID database. Each agency is requested to enter values for the height field item(s) that most closely correspond to the height of the dam definition(s) used by the agency. Height field items #26-28 that do not correspond to agency data maybe left blank***

(26) *Dam Height (Feet, Number)*
Enter, in feet to the nearest foot, the height of the dam, which is defined as the vertical distance between the lowest point on the crest of the dam and the lowest point in the original streambed.

(27) *Structural Height (Feet, Number)*
Enter, in feet to the nearest foot, the structural height of the dam, which is defined as the vertical distance from the lowest point of the excavated foundation to the top of the dam. Top of dam refers to the parapet wall and not the crest.

(28) *Hydraulic Height (Feet, Number)*
Enter, in feet to the nearest foot, the hydraulic height of the dam, which is defined as the vertical difference between the maximum design water level and the lowest point in the original streambed.

(29) *Maximum Discharge (Cubic Feet/Second, Number)*
Enter the number of cubic feet per second (cu ft/sec) which the spillway is capable of discharging when the reservoir is at its maximum designed water surface elevation.

(30) *Maximum Storage (Acre-Feet, Number)*
Enter, in acre-feet, the maximum storage, which is defined as the total storage space in a reservoir below the maximum attainable water surface elevation, including any surcharge storage.

(31) *Normal Storage (Acre-Feet, Number)*
Enter, in acre-feet, the normal storage, which is defined as the total storage space in a reservoir below the normal retention level, including dead and inactive storage and excluding any flood control or surcharge storage. For normally dry flood control dams, a zero value is acceptable. If unknown, please leave value blank and not zero.

(32) *Surface Area (Acres, Number)*
Enter, in acres, the surface area of the impoundment at its normal retention level.

(33) *Drainage Area (Square Miles, Number)*
Enter, in square miles, the drainage area of the dam, which is defined as the area that drains to a particular point (in this case, the dam) on a river or stream.

(34) *Downstream Hazard Potential (Alphanumeric)*
Enter the *code* to indicate the potential hazard to the downstream area resulting from failure or mis-operation of the dam or facilities:
      L for Low;
      S for Significant;
      H for High
      U for Undetermined.

Definitions, as accepted by the Interagency Committee on Dam Safety, are as follows:

1. LOW HAZARD POTENTIAL
Dams assigned the low hazard potential classification are those where failure or mis-operation results in no probable loss of human life and low economic and/or environmental losses. Losses are principally limited to the owner's property.

2. SIGNIFICANT HAZARD POTENTIAL

Dams assigned the significant hazard potential classification are those dams where failure or mis-operation results in no probable loss of human life but can cause economic loss, environment damage, disruption of lifeline facilities, or impact other concerns. Significant hazard potential classification dams are often located in predominantly rural or agricultural areas but could be located in areas with population and significant infrastructure.

3. HIGH HAZARD POTENTIAL

Dams assigned the high hazard potential classification are those where failure or mis-operation will probably cause loss of human life.

Hazard Potential Classification	Loss of Human Life	Economic, Environmental, Lifeline Losses
Low	None expected	Low and generally limited to owner
Significant	None expected	Yes
High	Probable. One or more expected	Yes (but not necessary for this classification)

4. UNDETERMINED HAZARD POTENTIAL
Dams for which a downstream hazard potential, as defined in 1-3 above, has not been designated or is not provided. Note that dams with a code "U" will be considered for NID inclusion (see Chapter 3) the same as a dam with low hazard potential. If included in the NID, the undetermined classification will be used in publication.

(35) *Emergency Action Plan (Alphanumeric)*
Enter the *code,* indicating whether this dam has an Emergency Action Plan (EAP) developed by the dam owner. An EAP is defined as a plan of action to be taken to reduce the potential for property damage and loss of life in an area affected by a dam failure or large flood.
        Y for Yes;
        N for No;
        NR for Not Required by submitting agency.
If an EAP is required (or not required) and has one, enter Y for Yes. If an EAP is required and does not have one, enter N for No. If there is not an EAP and one is not required, enter NR for Not Required.

(36) *Inspection Date (Number)*
Enter the date of the most recent inspection of the dam prior to the transmittal of the data by the submitting agency. Date fields require day, month and year information, and can use various alphanumeric or numeric combinations. The required format is mm/dd/yyyy (04/20/2008). If this format is not feasible, please use the DSPMT to converts all dates in other formats, such as mm/dd/yy (04/20/08) or yyyymmdd (20080420) into the NID-required mm/dd/yyyy format.

(37) *Inspection Frequency (Number)*
Enter the scheduled frequency interval for periodic inspections, in years.

(38) *Condition Assessment (Alphanumeric)*
Enter the assessment that best describes the condition of the dam based on available information.
Satisfactory;
Fair;
Poor;
Unsatisfactory;
Not Rated.

Definitions, as accepted by the National Dam Safety Review Board, are as follows:

1. SATISFACTORY
No existing or potential dam safety deficiencies are recognized. Acceptable performance is expected under all loading conditions (static, hydrologic, seismic) in accordance with the applicable regulatory criteria or tolerable risk guidelines.

2. FAIR
No existing dam safety deficiencies are recognized for normal loading conditions. Rare or extreme hydrologic and/or seismic events may result in a dam safety deficiency. Risk may be in the range to take further action.

3. POOR
A dam safety deficiency is recognized for loading conditions which may realistically occur. Remedial action is necessary. POOR may also be used when uncertainties exist as to critical analysis parameters which identify a potential dam safety deficiency. Further investigations and studies are necessary.

4. UNSATISFACTORY
A dam safety deficiency is recognized that requires immediate or emergency remedial action for problem resolution.

5. NOT RATED
The dam has not been inspected, is not under state jurisdiction, or has been inspected but, for whatever reason, has not been rated.

(39) *Condition Assessment Detail (Alphanumeric)*
Enter the specific detail that best describes the reason for the condition assessment. This field only applies to dams that were assigned the condition Satisfactory, Poor or Not Rated. If a dam was rated Unsatisfactory or Fair, this field should be left blank.

The drop-down menus are as follows. Please pick one value according to the condition assessment assigned to the dam.

1. Satisfactory
    • Meets applicable hydrologic and seismic regulatory criteria
    • Meets applicable tolerable risk criteria

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2. Poor
- Deficiency Recognized
- More Analysis Needed

3. Not Rated
- Dam has not been inspected
- Not under state jurisdiction
- Other

(40) *Condition Assessment Date (Number)*
Enter the date of the most recent assessment of the dam prior to the transmittal of the data by the submitting agency. Date fields require day, month and year information, and can use various alphanumeric or numeric combinations. The required format is mm/dd/yyyy (04/20/2008). If this format is not feasible, please use the DSPMT to converts all dates in other formats, such as mm/dd/yy (04/20/08) or yyyymmdd (20080420) into the NID-required mm/dd/yyyy format.

(41) *Spillway Type (Alphanumeric)*
Enter the *code* that describes the type of spillway:
       C for Controlled;
       U for Uncontrolled;
       N for None.

(42) *Spillway Width (Number)*
Enter the width of the spillway, to the nearest foot, available for discharge when the reservoir is at its maximum designed water surface elevation. Typically for an open channel spillway, this is the bottom width.

(43) *Outlet Gates (Alphanumeric)*
Enter *one or more of the following codes* that describe the type of (1) spillway and (2) controlled outlet gates, if any:
       X for None;
       U for Uncontrolled;
       T for Tainter (radial);
       L for Vertical Lift;
       R for Roller;
       B for Bascule;
       D for Drum;
       N for Needle;
       F for Flap;
       S for Slide (sluice gate);
       V for Valve;
       O for Other controlled.

Enter up to five types in decreasing size order, separated by semicolons, followed by number of gates.

(44) *Volume of Dam (Cubic yards, Number)*
Enter the total number of cubic yards occupied by the materials used in the dam structure. Portions of powerhouse, locks, and spillways are included only if they are an integral part of the dam and required for structural stability.

(45) *Number of Locks (Number)*
Enter the number of existing navigation locks for the project.

(46) *Length of Locks (Feet, Number)*
Enter the length of the primary navigation lock to the nearest foot.

(47) *Lock Width (Number)*
Enter the width of the primary navigation lock to the nearest foot.

*** NOTE: The next five fields (48-52) are for state submissions only ***

(48) *Permitting Authority*
Enter Yes if the state regulatory organization has the authority to review and approve plans and specifications to construct, enlarge, remove, and abandon dams (from the Dam Safety Act of 2006).

(49) *Inspection Authority*
Enter Yes if the state regulatory organization has the authority to require or perform the inspection, at least once every five years, of all dams and reservoirs that would pose a significant threat to human life and property in case of failure to determine the continued safety of the dams and reservoirs (from the Dam Safety Act of 2006) .

(50) *Enforcement Authority*
Enter Yes if the state regulatory organization has the authority to issue notices, when applicable, to require owners of dams to perform necessary maintenance or remedial work, revise operating procedures, or take other actions, including breaching dams when necessary (from the Dam Safety Act of 2006).

(51) *State Jurisdictional Dam*
Enter Yes if this dam meets the state regulatory organization's definition of a jurisdictional dam. For example, in New Mexico a jurisdictional dam is defined as a dam that exceeds 10 feet in height regardless of storage or a dam that stores more than 10 acre-feet regardless of height. Therefore, in New Mexico, all dams that meet that state criteria will have Yes listed in this field.

(52) *State Regulatory Agency (Alphanumeric)*
Enter the name of the primary state agency with regulatory or approval authority over the dam.

*** NOTE: The remaining fields are federal submissions only. See Table 1B for required codes for the following fields***

(53) *Federal Agency Involvement in Funding (Alphanumeric)*
Enter the code identifying which federal agency was involved in funding of the dam. Codes are separated by semi-colon if several agencies were involved.

(54) *Federal Agency Involvement in Design (Alphanumeric)*
Enter the code identifying which federal agency was involved in the design of the dam. Codes are separated by semi-colon if several agencies were involved.

(55) *Federal Agency Involvement in Construction (Alphanumeric)*
Enter the code identifying which federal agency was involved in the construction of the dam. Codes are separated by semi-colon if several agencies were involved.

(56) *Federal Agency Involvement in Regulatory (Alphanumeric)*
Enter the code identifying which federal agency is involved in the regulation of the dam. Codes are separated by semi-colon if several agencies are involved.

(57) *Federal Agency Involvement in Inspection (Alphanumeric)*
Enter the code identifying which federal agency is involved in the inspection of the dam. Codes are separated by semi-colon if several agencies are involved.

(58) *Federal Agency Involvement in Operation (Alphanumeric)*
Enter the code identifying which federal agency is involved in the operation of the dam. Codes are separated by semi-colon if several agencies are involved.

(59) *Federal Agency Owner (Alphanumeric)*
Enter the code identifying which federal agency partly or wholly owns the dam. Codes are separated by semi-colon if several owners are involved.

(60) *Federal Agency Involvement – Other (Alphanumeric)*
Enter the code identifying which federal agency is involved in other aspects of the dam. Codes are separated by semi-colon if several owners are involved.

5. DATA PREPARATION

INTRODUCTION

To assist with the NID updates, USACE has developed desktop software which works in conjunction with the Dam Safety Program Performance Measures to facilitate a NID Electronic Submittal Workflow. This software is a natural extension of the NID and as part of the Dam Safety Program Management Tools (DSPMT) will help users provide a consistent, error-checked electronic submittal of inventory information. All data submitters are strongly encouraged to use the DSPMT for this NID submittal. There are also detailed instructions of the DSPMT Electronic Submittal Workflow at www.safedams.org, under the NID Update Section.

ORGANIZATION OF INVENTORY DATA

As in past NID submittals, adherence to Candidate Submittal file specifications is crucial to efficient and unambiguous use of agency NID data for the NID. Agencies should ensure that all new and existing data entered in the Candidate Submittal follows the proper field order, type, and code (when applicable) specified in the following sections and Table 1. The DSPMT allows users to create a synonym list which converts individual agency codes to the NID codes. For example, if an agency uses "2" to describe significant hazard classification, the synonym list will convert "2" to "S" for the NID submittal.

Field Order
The Candidate Submittal file must include the 52 data elements (55 for federal agencies) in the proper order, as shown in Table 1. If a particular field item is unknown or not available for transmission, a blank or null field must still be created in the proper location in the Candidate Submittal. DSPMT users will simply not map a local field to the unknown NID field. Subsequently, the field will appear as a blank entry in the NID until the information has been updated at the agency level, and added to the system.

Field Type
Each field in the NID is specified as alphanumeric, number or date field. Alphanumeric fields can include any type of printable characters, e.g., letters, numbers, symbols, and blank spaces. However, quotation marks and commas should not be used in any of the NID fields, as these symbols are sometimes used to separate fields, and their use in a data item could cause misinterpretation of the data. If multiple entries are made for any alphanumeric field, the concatenation symbol must be specified in the cover letter.

Numeric fields consist of only numbers, which can be integer or decimal values. If decimal values are transmitted, the decimal point must be transmitted as part of the data entry.

Date fields require day, month and year information, and the required format is the mm/dd/yyyy (05/24/2005). The DSPMT software includes the capability to convert all dates into the NID mm/dd/yyyy format.

Encoded Fields
Data entry for 10 fields requires specific codes, which are given in Chapter 4, *List of Field Definitions*. These fields are:

- OWNER TYPE
- NONFEDERAL DAM ON FEDERAL PROPERTY
- DAM TYPE
- CORE
- FOUNDATION
- PURPOSES
- DOWNSTREAM HAZARD POTENTIAL
- EMERGENCY ACTION PLAN
- SPILLWAY TYPE
- OUTLET GATES

Multiple entries in encoded fields (where applicable) are simply concatenated (no separators). The only exception is OUTLET GATES, where multiple entries must be separated by semi-colons.

Missing Data/Null Entry/Unrecognizable Data
If information in a particular field is unknown or not available for creation of the Candidate Submittal file, a blank field must exist to avoid misinterpretation of other fields. DSPMT users will simply not map a local field to the unknown NID field. Subsequently, the field will appear as a blank entry in the NID until the information has been updated at the agency level, and added to the system. Note that some encoded fields have specific codes for unknown data, which should be used where applicable. For example, if Downstream Hazard Potential is unknown, a "U" should be entered. Unrecognizable, illogical, or absent data for Downstream Hazard Potential, Dam Height, Maximum or Normal Storage, or NID ID will result in exclusion of the dam from the NID.

FILE FORMAT

A variety of database management software can be used to produce the Candidate Submittal file, according to the specifications presented in the previous section. Most software (dBase, Access, Paradox, FoxPro, and others) that run on Windows 98/NT/2000/XP can produce a database or ASCII text file that can be read and interpreted by TEC. Note that these software packages usually have the capability of adding and manipulating fields, copying columns from other databases, and converting codes from one specification to another. The DSPMT software utilizes Microsoft Access and many database formats can be imported into Microsoft Access then brought into the DSPMT for the electronic submittal. Please contact TEC or Beacon Resources for questions concerning the import of local data into the DSPMT.

Commercial Off-The-Shelf (COTS) and Custom Database Management Software
If COTS software is used to produce the Candidate Submittal for transmission to TEC, a database file in the default format of the software should be produced. Because the DSPMT and NIDChecks utilize Microsoft Access, TEC prefers files sent in the Microsoft Access format.

6. TRANSMISSION METHODS

INTRODUCTION

After the NID information has been gathered and compiled into the Candidate Submittal, reviewed for errors, compliance with the NID file structure is ensured, and the cover letter has been drafted, then the Candidate Submittal is ready for transfer to TEC. Data can be transmitted in a variety of ways to TEC, including the most the common methods of Internet File Transfer Protocol (FTP), Internet electronic-mail (e-mail), and CD. The preferred options are the use of FTP or e-mail, for which detailed instructions are provided. CDs are the preferred method for hard media transfer. If none of the first three methods is feasible, the agency should coordinate with TEC to ensure compatibility with TEC computers. The DSPMT software utilizes ftp to send the final submittal file to TEC. This command requires an Internet connection and ftp password. If you have lost or forgotten the password, send an e-mail to nidpassword@safedams.org and the password will be sent back to you. The following sections only apply to agencies not using the DSPMT software to create and send their submittal to TEC.

FILE TRANSFER PROTOCOL (FTP)

If not using the DSPMT, the preferred transmission method is the use of File Transfer Protocol (FTP), in which files can be received or transmitted over the Internet, with the assurance that the receiver gets the file in the original format. Note that this method enables exchange of sample files between the agency office and TEC, as well as download of documents, files and software from TEC that might assist the state in the update process. Access to the Internet is required, usually through service provided by the agency or a commercial provider, and FTP software. Data coordinators should contact their system administrators or other personnel in their office familiar with Internet access to determine if they have FTP capability and software. Please contact TEC if FTP software is needed. For detailed instructions on the FTP procedures, please contact TEC.

ELECTRONIC MAIL (E-MAIL)

The use of e-mail is the second preferred method of transmitting the data. Most e-mail software and services have the capability of transferring files, such as those produced by database and word processor software, as an accompanying file, or attachment, to the e-mail message. If a data coordinator currently uses e-mail, this is probably the simplest and quickest method of file transmission. However, note that some e-mail systems or services, in transmitting or receiving files (or both), restrict the size of e-mail attachments to reduce burden on the network system. Note also that some e-mail systems may not properly receive some database or word processor files, resulting in some of the data being received as unintelligible characters.

If e-mail is being used to transfer the Candidate Submittal to TEC, first determine the size of the file, or any other file to be transmitted. If the file exceeds 5 MB, the TEC system may not be unable to receive the file, and another transmission method (FTP, CD) must be used. If the file is less than 5 MB, attach the file to an e-mail message addressed to rebecca.ragon@usace.army.mil or mike@ienc.org. Attach any other pertinent files as well, such as the cover letter. In the e-mail message, state your name, full address, phone number, and the form of the attached file(s), i.e. Microsoft Access 2002, dBase 4.0, ASCII Delimited Text, Microsoft Excel, etc, and send the file. Upon receipt of file, TEC will send back an e-mail message for receipt confirmation, including indication of successful/unsuccessful interpretation of the attachment. If receipt confirmation is not received within two business days or the interpretation of the attachment was unsuccessful, contact TEC at (703) 428-6820 for further coordination. All NID participants can check the submittal status on http://www.safedams.org.

CD-ROMS AND OTHER MEDIA TYPES

If electronic methods are not feasible for file transmission, the preferred media is CD. After copying the file(s) to the CD, send to TEC. Please include your name, address, phone number, form of the file, and (if used) the compression routine. Send to:

    U.S. Army Topographic Engineering Center
    ATTN: CEERD-TR-A (National Inventory of Dams)
    7701 Telegraph Road
    Alexandria, VA 22315-3864

7. CANDIDATE SUBMITTAL COVER LETTER PREPARATION

INTRODUCTION

Because of the wide variation possible in the content, code and format of the Candidate Submittal, it is necessary to provide supplemental information to the TEC data processing staff, in the form of a *Candidate Submittal Cover Letter*. The purpose of the *Cover Letter* is to provide the TEC staff with the information needed to efficiently read and understand the agency's NID data file. The *Candidate Submittal Cover Letter* does not include site specific dam inventory information. Rather, it provides information relating to:

- The people to contact within the state for additional information or to resolve questions; and

- A review of the options selected by the state in the preparation, conversion and transmittal of the agency's Candidate Submittal.

See the Appendix, *CANDIDATE SUBMITTAL COVER LETTER* for an example copy of the transmittal *Cover Letter* form. Additional copies are available, as well as an electronic version.

The *Candidate Submittal Cover Letter* should be completed by filling in the requested information for each item, and sent in electronic or hard copy form with the Candidate Submittal to TEC. Those agencies using electronic mail or ftp software are requested to send an electronic version of the completed *Candidate Submittal Cover Letter* along with the Candidate Submittal file. DSPMT users will complete the *Candidate Submittal Cover Letter* as part of the automatic NID update process and do not need to create a separate file outside the DSPMT.

The contents of the *Candidate Submittal Cover Letter* pertaining to each of the areas of requested information is discussed further in the following sections. The item numbers reference the number used in the Candidate Submittal Cover Letter Form. For example, *#1) SUBMITTING AGENCY CONTACT* is the first item on the form.

AGENCY CONTACT INFORMATION

#1-SUBMITTING AGENCY CONTACT
The *Candidate Submittal Cover Letter* is to include the following information pertaining to people to contact within the agency for additional information or to resolve questions:

- The State Name;
- Date;
- Agency Contact Information, including the Name, Title, Agency, Address and Telephone Number of the person(s) to contact with respect to the different types of information concerning the Candidate Submittal and the Inventory of Dams data.

#2 – CANDIDATE SUBMITTAL FORMAT
The format used in the Candidate Submittal transmitted to TEC should be indicated in the *Candidate Submittal Cover Letter* by checking one of the two supported standards. The supported standards are summarized as follows:

- **ASCII DELIMITED TEXT:** There are four types of delimited text that can be used. In a delimited ASCII/Tilde text file, fields are separated by a tilde ~ character. Records are separated by a line return. In a delimited ASCII text file, quotes are used around character fields and fields are separated by commas. Records are separated by a line return. In a fixed length ASCII text file, each field begins at a designated column position and has a fixed length. Records are separated by a line return. If Fixed Length ASCII is used, the section in the *Candidate Submittal Cover Letter* must be completed, giving the designated beginning column position and field length for each field. In an EBCDIC file, using text only with no control symbols, each field begins at a designated column position and has a fixed length. Records are separated by a line return. If Fixed Length EBCDIC is used, the section in the *Candidate Submittal Cover Letter* must be completed, giving the designated beginning column position and field length for each field.

- **DATABASE FILE:** Any database software program may be used including PARADOX, ACCESS, DBASE and FOXPRO. If your software is not listed, please indicate program under OTHER. Always include the version of the software.

#3 – DATA COMPRESSION METHOD (If Used)
Data compression methods should be used if the files are too large for a CD or if e-mail transmission is preferred. Please indicate the compression method used.

#4 - TRANSMITTAL METHOD
The Candidate Submittal can be transmitted to TEC in several different ways. The transmittal method used should be indicated in the *Candidate Submittal Cover Letter* by checking one of the supported standards. The preferred options are transmittal by ftp (file transfer protocol) and e-mail. CDs can also be mailed to TEC. (See Chapter 6 for detailed instructions on transmission methods).

APPENDIX:

CANDIDATE SUBMITTAL
COVER LETTER

NATIONAL INVENTORY OF DAMS

CANDIDATE SUBMITTAL COVER LETTER

STATE or FEDERAL AGENCY NAME: _____

DATE:_____

1) AGENCY CONTACT List the persons in your agency to contact with respect to the different types of information concerning your agency Candidate Submittal and your Inventory of Dams data.

Circle the term, *Candidate Submittal File Structure, Inventory Data,* or *Both* to indicate the type of information with which each person is familiar.

_____

AGENCY CONTACT INFORMATION

NAME: _____

TITLE: _____

AGENCY: _____

ADDRESS: _____

CITY: _____ **STATE:** _____ **ZIP:** _____

TELEPHONE: _____

   CONTACT ABOUT: CANDIDATE SUBMITTAL FILE STRUCTURE   INVENTORY DATA   BOTH

_____

NAME: _____

TITLE: _____

AGENCY: _____

ADDRESS: _____

CITY: _____ **STATE:** _____ **ZIP:** _____

TELEPHONE: _____

   CONTACT ABOUT:CANDIDATE SUBMITTAL FILE STRUCTURE   INVENTORY DATA   BOTH

_____

NAME: _____

TITLE: _____

AGENCY: _____

ADDRESS: _____

CITY: _____ **STATE:** _____ **ZIP:** _____

TELEPHONE: _____

   CONTACT ABOUT: CANDIDATE SUBMITTAL FILE STRUCTURE   INVENTORY DATA   BOTH

_____

2) CANDIDATE SUBMITTAL FORMAT: Check the format used for the Candidate Submittal transmittal file.

_____	DSPMT Software
_____	ASCII DELIMITED TEXT
_____	ACCESS (Include version)
_____	DBASE (Include version)
_____	FOXPRO (Include version)
_____	PARADOX (Include version)
_____	OTHER, _____

3) DATA COMPRESSION METHOD (If Used) _____

4) TRANSMITTAL METHOD: Check the transmittal method used.

_____	DSPMT
_____	FTP
_____	E-mail
_____	Diskettes in mail
_____	Other, _____