Verification Of A National Water Data Base Using A Geographic Information System

By Howard E. Harrison

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Abstract

The National Water Data Exchange (NAWDEX) was developed to assist users of water resource data in the identification, location, and acquisition of data. The Master Water Data Index (MWDI) of NAWDEX currently indexes the data collected by 423 organizations from nearly 500,000 sites throughout the United States.

The utilization of new computer technologies permit the distribution of the MWDI to the public on compact disc. In addition, geographic information systems (GIS) are now available which can store and analyze these data in a spatial format. These recent innovations could increase access and add new capabilities to the MWDI. Before either of these technologies could be employed, however, a quality-assurance check of the MWDI needed to be performed.

The MWDI resides on a mainframe computer in a tabular format. It was copied onto a workstation and converted to a GIS format. The GIS was used to identify any errors in the MWDI and produce reports that summarized these errors. The summary reports were sent to the responsible contributing agencies along with instructions for submitting their corrections to the NAWDEX Program Office.

The MWDI administrator received reports that summarized all of the errors identified. Of the 494,997 sites checked, 93,440 sites had at least one error (18.9-percent error rate).

Introduction

Background

Water plays an increasingly important role in our nation's development. In order to maximize the wise use and protection of this resource, it is necessary to have access to accurate water-quality and quantity data collected throughout the country.

National Water Data Exchange

In 1971, a task force of the Federal Interagency Advisory Committee on Water Data designed the National Water Data Exchange (NAWDEX) to assist users of water-related data in the identification, location, and acquisition of available water data. The United States Geological Survey (USGS) accepted the lead role for implementation of NAWDEX in 1973 and the program became operational in January 1976.

NAWDEX is administered by the USGS through the NAWDEX Program Office in Reston, Virginia and at 67 assistance centers across the United States. In its Master Water Data Index (MWDI), NAWDEX currently indexes data collected at nearly 500,000 sites throughout the United States. These sites are monitored by 423 federal, interstate, state, local, and foreign government agencies as well as educational institutions and private organizations.

New computer technologies now permit the distribution of the MWDI to the public on compact disc. In addition, geographic information systems (GIS) are now available that have the ability to store and analyze these data in a spatial format. These innovations could increase access and add new capabilities to the MWDI. Before either of these technologies could be employed, however, the NAWDEX Program Office determined that a quality-assurance check of the MWDI needed to be performed. The GIS section of the Portland, Oregon office of the

USGS was contracted by the NAWDEX Program Office for this purpose.

Geographic Information Systems

A GIS is a collection of computer hardware and software that can capture, update, manipulate, analyze, and display geographically referenced information. Version 5.0.1 of the ARC/INFO GIS software package was used for this project. ARC stores the geographic coordinates and INFO is the relational data base management system (RDBMS) that stores the attribute data linked to the geographic features.

Computer Environment

This project was conducted on a Data General AViiON 300 workstation using the American Telephone and Telegraph Bell Laboratory version of the UNIX operating system. The workstation was equipped with sixteen megabytes of random access memory and there was a 700 megabyte project directory on a local disk within which all data were stored and processed.

Purpose and Scope

This report documents the methods used in the verification of the MWDI and presents the results of the analysis. All ARC Macro Language (AML) programs and FORTRAN77 (ANSI, 1978) routines used are presented in Appendix A.

The results represent the status of the MWDI, as of 1991, for the continental United States, Alaska, and Hawaii. The errors identified in the MWDI by this project are those resulting from either incorrect geographic coordinates or codes that did not match valid choices as specified by Perry and Williams (1982). No attempt was made to determine if the correct code was used from among valid choices.

Definition of Terms

Albers Equal Area Projection	A conic map projection using two standard parallels to reduce distortion of area
AML	ARC Macro Language, high-level algorithmic programming language specific to the ARC/INFO GIS software
Attribute	Information which describes geographic features in a coverage, stored in tabular format
Coverage	Digital map consisting of geographically referenced features, usually representing a single theme
Directory	Computer disk storage location containing files and subdirectories
Item	A field of information in an attribute table, displayed as a column.
Hydrologic Units	Drainage basins located throughout the United States, determined by the topography and used to provide standard framework for water-resource planning
Overlay	Process which merges two overlapping coverages and their attributes to form a third coverage
PAT	Point or polygon attribute table, contains attribute data for a point or polygon coverage
Point	Feature in a coverage represented by a single x,y coordinate
Polygon	An areal feature in a coverage defined by the lines which bound it
Projection	A systematic conversion of locations on the earth's surface from spherical to planar coordinates.
Relate	A temporary link between records in two files based on an item common to both
Shell script	A program written in the UNIX shell programming language

Acknowledgments

I wish to acknowledge the assistance of Janice Gordon and Leonard Orzol in writing and compiling the FORTRAN77 routines required for this project.

Approach

The first step in this project was to copy the MWDI from the USGS mainframe computer at Reston, Virginia onto nine-track magnetic tapes. This procedure was accomplished by the NAWDEX Program Office over a 4-month period. Sites were retrieved from the MWDI by state and written onto individual magnetic tapes in the 1,688-byte American Standard Code for Information Interchange (ASCII) format. Each record in these ASCII files contained the information for a unique site (NAWDEX_ID). The NAWDEX_ID is composed of the five character agency code (NAWDEX_AGCY), as described by Edwards, Josefson, and Blackwell (1983), and the 15 character station number assigned by the agency (AGCY_STA_NO).

When each magnetic tape was received, the ASCII file was read into its respective state directory on the workstation. The NDX_INSTALL.AML program and FORTRAN77 routines converted this tabular data file into a GIS coverage. Latitude and longitude (degrees, minutes, and seconds) were extracted from each record and then projected into the Albers Equal Area coordinate system (meters) using the parameters listed in table 1. The Albers coordinates were used by the GIS to create a point coverage of the site locations (LOC).

The remaining attribute information was extracted from each record and loaded as items in the LOC point attribute table (PAT) and eight attribute data files. The item was filled with nines whenever any attribute was missing a value. The following attribute data files were created using the RDBMS (INFO): SW_DATA (surface water), GW_DATA (ground water), QW_DATA (water quality), BIO_DATA (biological), CHM_DATA (chemical), SED_DATA (sediment), PHY_DATA (physical), and MET_DATA (meteorological). The LOC.PAT and all eight attribute data files were related as indicated in figure 1, although only three attribute data files are shown in the example. These attribute data files and the LOC.PAT resided in the INFO directory beneath each state directory. The structure and item definitions for the attribute data files are found in Appendix B. The item names used in these files refer to the MWDI component names specified by Perry and Williams (1982). Figure 2 shows the project directory structure after the installation was completed.

Identification of Errors

Errors were identified using the NONGEO.AML, MIS_DUP.AML, and GEO.AML programs executed in sequence by the DRIVER.AML program for a specified state. These programs were demanding on the workstation's central processing unit and, depending on the number of sites in the state, took from 8 to 30 hours to complete. A UNIX shell script started the ARC/INFO software and then executed the

Table 1. Albers equal area projection parameters

[Coordinates in degrees (^{o}), minutes (′) , and seconds (″); US = United States]

Parameter	States		
	Conterminous US	Alaska	Hawaii
	Coordinates		
First Standard Parallel	29° 30′ 00″	55° 00′ 00″	08° 00′ 00″
Second Standard Parallel	45° 30′ 00″	65° 00′ 00″	18° 00′ 00″
Central Meridian	-96° 00′ 00″	-154° 00′ 00″	-157° 00′ 00″
Latitude of Projection Origin	23° 00′ 00″	50° 00′ 00″	03° 00′ 00″
False Easting (meters)	0	0	0
False Northing (meters)	0	0	0

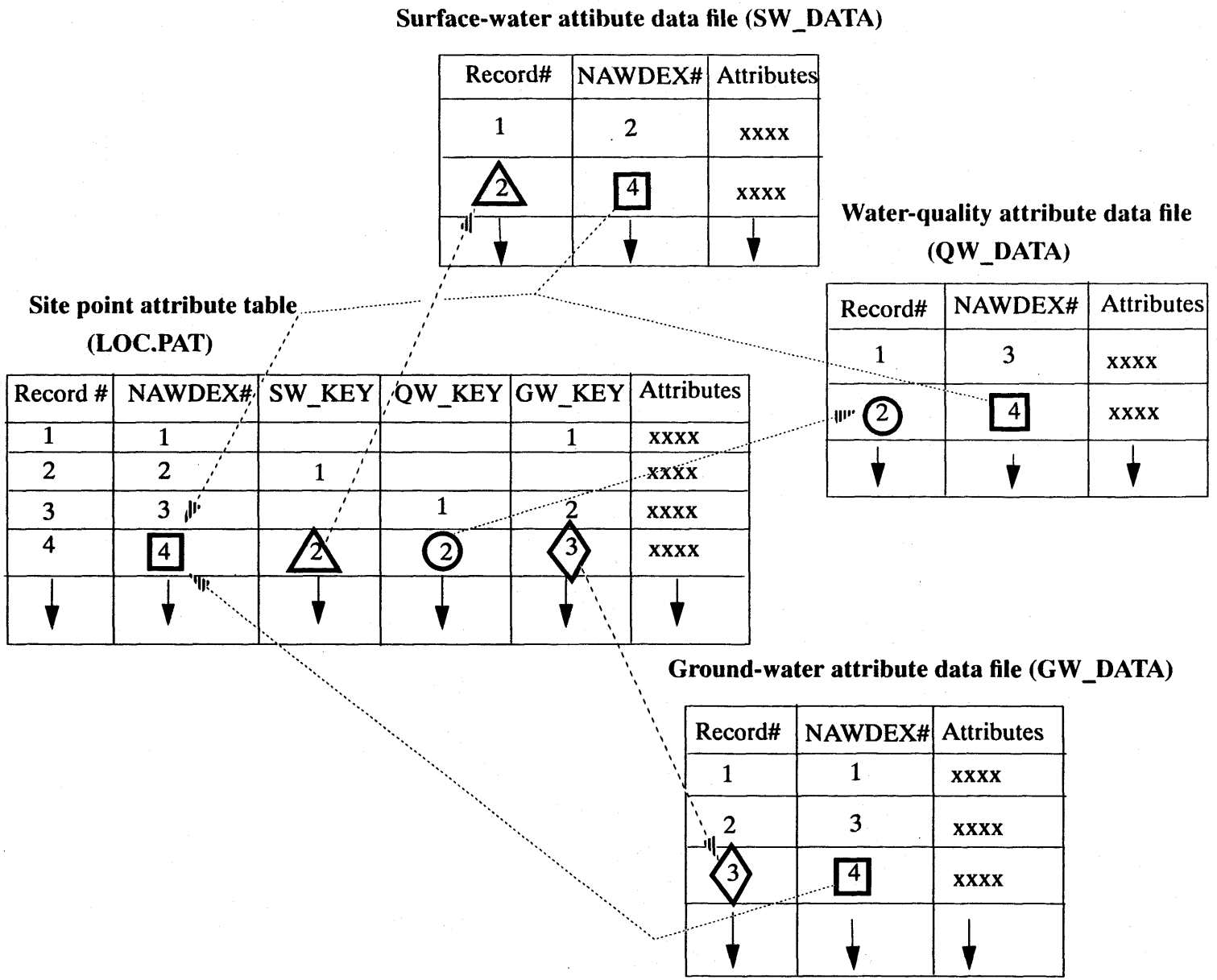

Figure 1. Example showing linkages used for relating files in the INFO directory.

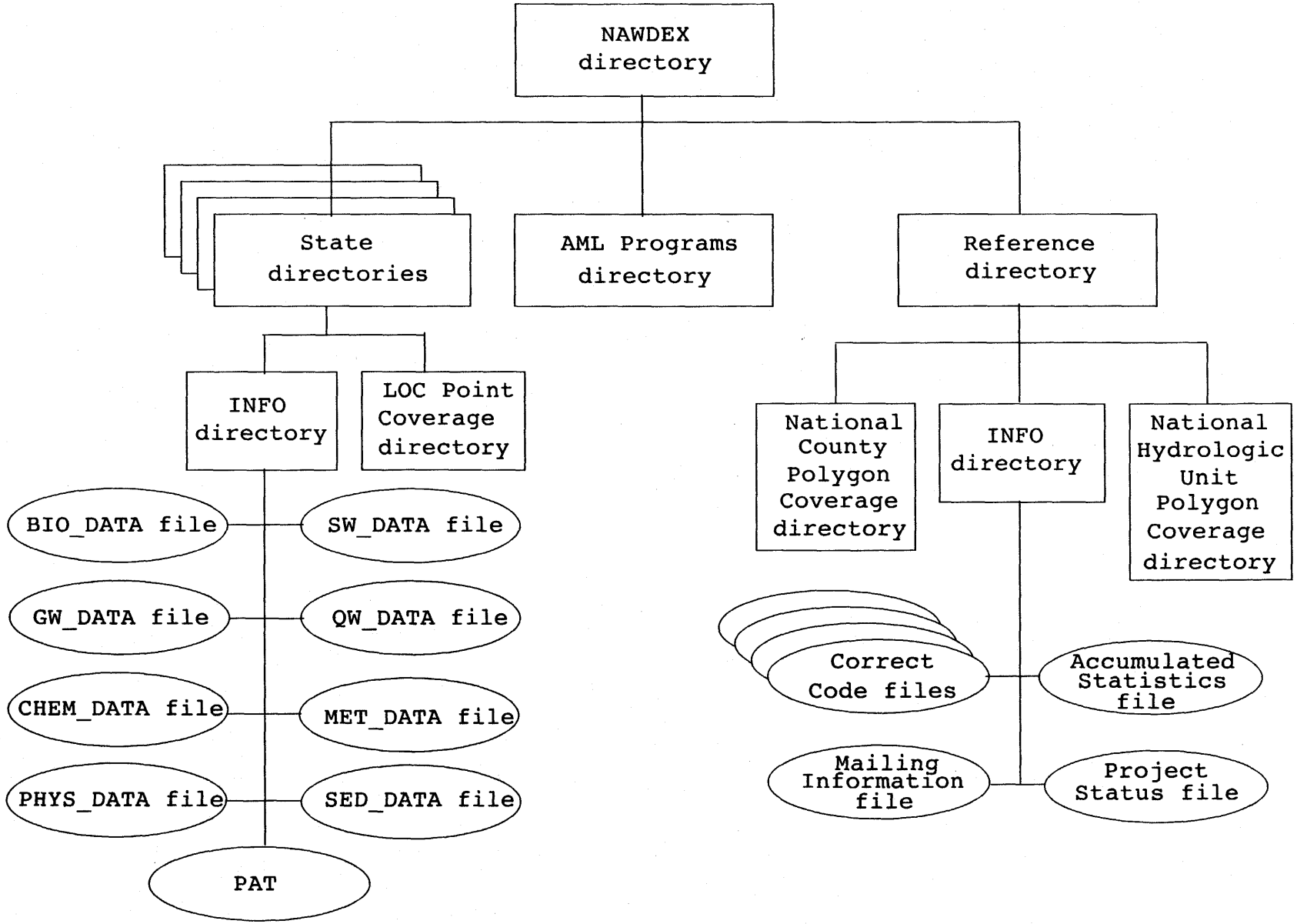

Figure 2. Diagram showing directory structure after NDX_INSTALL.AML is completed.

DRIVER.AML program; this allowed for batch processing.

Geographic Codes

Sites which did not contain geographic coordinates (latitude, longitude) in the original ASCII file could not be interpreted by the GIS and therefore were not included in the LOC. Sites missing coordinates, as well as sites that shared identical geographic coordinates, were identified using the MIS_DUP.AML program. Although shared geographic coordinates do not necessarily indicate an error, the information was provided to agencies to alert them that duplicate sites existed in the MWDI.

National polygon coverages of county and hydrologic-unit boundaries were obtained at a scale of 1:2,000,000 for the conterminous United States, Hawaii, and Alaska. These national coverages were used to determine the geographic accuracy of the MWDI. Three attributes in the LOC.PAT were examined: (1) Federal Information Processing Standards (FIPS) state code (STATE), (2) FIPS county code (COUNTY), and (3) hydrologic-unit code (HYDROL_UNIT).

The GEO.AML program created county and hydrologic-unit polygon coverages for each state from the national coverages. The resulting state polygon coverages were used to perform overlays with the LOC. After the overlays were accomplished the STATE, COUNTY, and HYDROL_UNIT codes from the MWDI were compared with the codes obtained from the state coverages at each site.

When the code from the MWDI did not match the code from the state coverage, a geographic error existed for the attribute at that site. Geographic errors resulted from one of three conditions: (1) the geographic coordinates (latitude and longitude) of the site were incorrect, (2) the code did not match the actual site location, or (3) the code was an invalid choice for the state. When an error due to one of the first two conditions was identified in either HYDROL_UNIT or COUNTY, the program calculated the distance from the site to the nearest boundary of the polygon in the state coverage with the value matching the site's code. This distance was helpful in distinguishing between errors due to the coarse resolution (small scale) of the national polygon coverages and actual errors.

A simplified example of this overlay process is shown in figure 3. The LOC point coverage (1) and county polygon coverage (2) are merged (3). The resulting point coverage (4) contains both the item COUNTY, from the MWDI, and the item FIPS:CO from the county polygon coverage. A comparison of these two items in the point coverage (4) leads to the conclusion that sites 2, 3, and 4 are geographically correct. Their geographic coordinates placed them in the correct polygon from the county coverage; the items COUNTY and FIPS:CO match. However, site 5 is coded in the MWDI as being in county C whereas its geographic coordinates placed it in county A of the county polygon coverage. Either its geographic coordinates or its COUNTY code are wrong in the MWDI. A distance, D, is calculated between site 5 and the nearest boundary of the polygon (FIPS:CO = C) in the county polygon coverage. The only valid county codes for this state are A, B, or C. Site 1 has a county code of Z in the MWDI whereas its geographic coordinates placed it in county A of the county polygon coverage. Therefore, this site is also in error; however, in this case no distance is calculated.

Non-geographic Codes

A relate process was used to check 138 of the remaining 189 attributes in the LOC.PAT and the eight attribute data files. Those attributes not checked were either not used at the time of the project or had infinite coding combinations. The NONGEO.AML program compared the value of each attribute at each site to a reference file containing the valid choices for that attribute. These reference files were created from the valid codes specified by Perry and Williams (1982). If the value did not match the valid choices then an error existed.

An example of how the attribute SW_TELEMETRY, located in SW_DATA, is checked is illustrated in figure 4. SW_DATA is related to two files: (1) the LOC.PAT by NAWDEX# and (2) the reference file by the SW_TELEMETRY code. An error is identified in Record Number 4 because the SW_TELEMETRY code does not match the valid choices in the reference file. The NAWDEX_ID and site name (STATION_NAME) are obtained from the LOC.PAT.

Distribution of Error Reports

When errors were identified by each program, the necessary information was written into INFO files. The REPORTS.AML program used the RDBMS to output

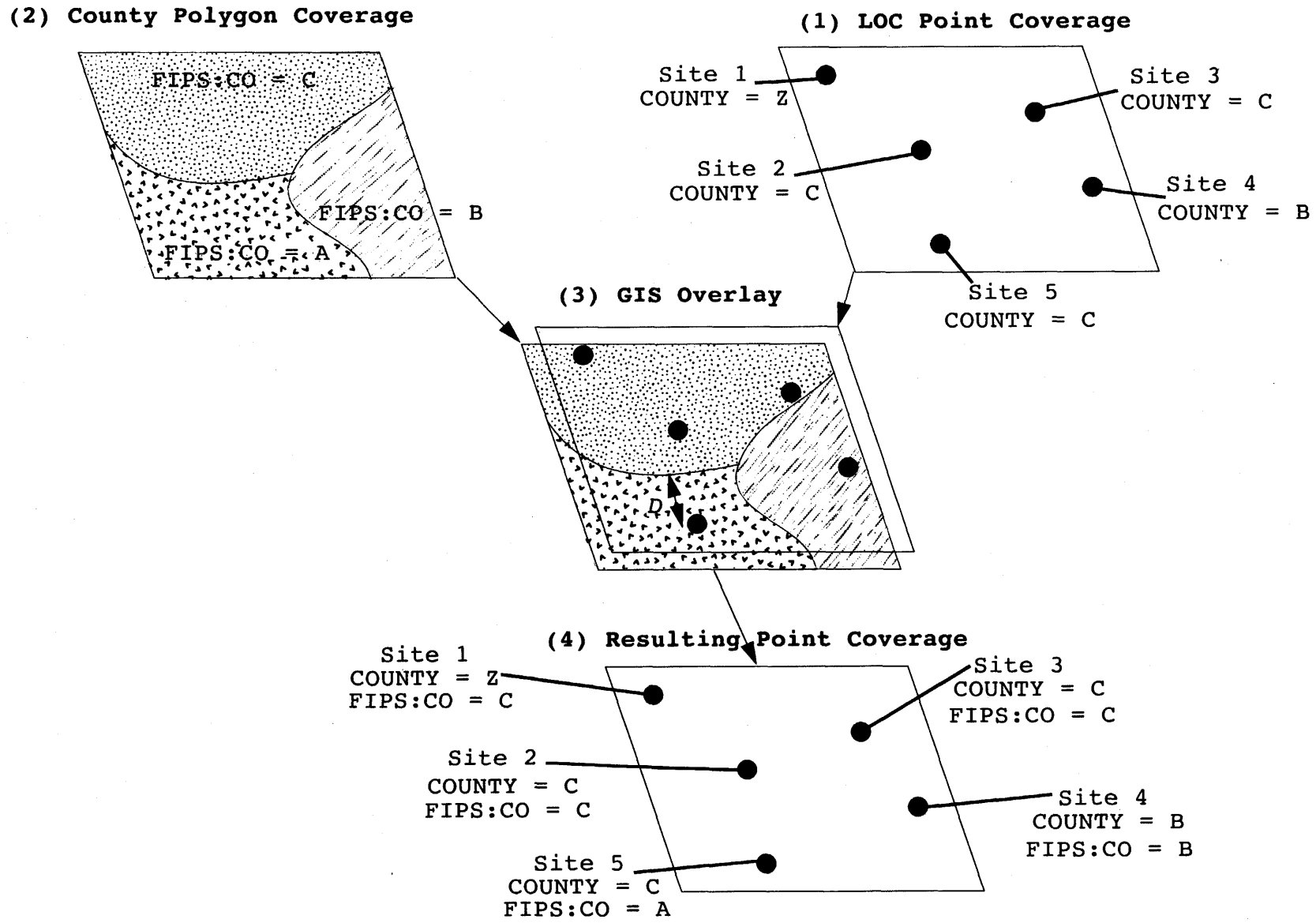

Figure 3. Example using a geographic information system (GIS) overlay to identify geographic errors.

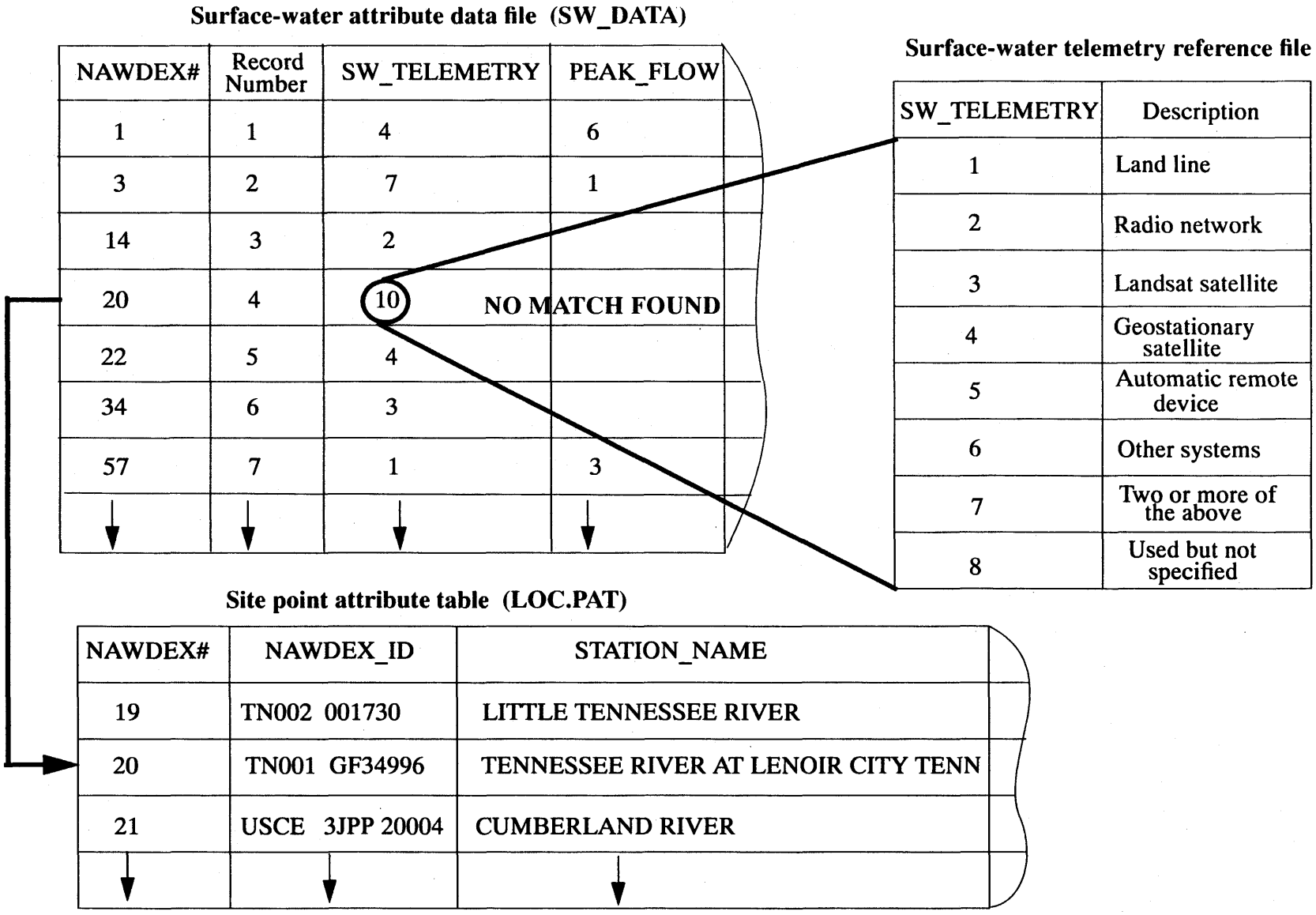

Figure 4. Example using related files to identify non-geographic errors.

reports from these INFO files for each agency having sites with errors, as well as a state summary for the MWDI administrator. Figures 5, 6, and 7 are examples of the three types of reports produced for distribution to the individual agencies. State error files were appended into a single file for nationwide statistical analyses once all states were completed.

The NAWDEX Program Office supplied an ASCII file containing all agency contacts and addresses. The necessary mailing information was obtained by relating this file to the error files using the NAWDEX_AGCY codes. The PRINT.AML program printed the agency error reports and cover letters. Mailing labels were printed using a personal computer.

Results

A total of 494,997 MWDI sites were checked using the described approach. There were 93,440 sites identified with one or more attributes in error. This is an error rate of 18.9 percent. Of the 118,135 attributes in error, 17,739 were non-geographic and 100,396 were geographic. Of the geographic errors, 10,956 were due to missing coordinates and the remaining 89,440 were errors in the STATE, COUNTY, or HYDROL_UNIT codes. The total number of errors identified are summarized by attribute in table 2.

Of the 423 agencies indexed in the MWDI, 267 had at least one site containing errors. The error rates for each agency contributing more than 1,000 sites to the MWDI are listed in table 3. The 24 agencies listed in table 3 are responsible for approximately 92 percent of the sites in the MWDI.

There were 38,036 cases of sites sharing common geographic coordinates involving a total of 104,976 sites. More than half of these cases involved only two sites and 88 percent of these cases involved four sites or less. However, there were 28 cases in which more than 100 sites shared the same geographic coordinates. The sites in a specific case could belong to the same agency or to several different agencies. In the case 3 of figure 6, there are four duplicate sites belonging to three agencies (USGS, USFS, and CO007). As previously stated, duplicate sites were not considered errors but they were identified for management purposes.

Some problems were encountered during this project. All retrievals were made by STATE; if the STATE code was incorrect then COUNTY and HYDROL_UNIT also were identified as errors even though they might have been correct. For example, if a Connecticut (STATE = 9) site was inadvertently coded as being in Colorado (STATE = 8), then its HYDROL_UNIT (01100005, Housatonic River), which was valid in Connecticut, would be invalid according to the hydrologic units found in Colorado. Although the site's COUNTY code (001, Fairfield) would be valid because that code also represented a valid choice in Colorado (Adams County), its geographic coordinates would not place the site in that county, thereby generating another error.

The number of geographic errors was further inflated by the coarse resolution (small scale) of the reference coverages and by the geographic coordinate accuracy reported by the agency. The geographic coordinates for sites near the polygon boundaries or on coastal islands may have placed these sites in the wrong polygon of the reference coverage or entirely outside of the state. It appeared that some agencies only reported geographic coordinates to the nearest minute which also generated errors; examples of this are found in cases 1 and 2 of figure 6.

Although NAWDEX_AGCY is a mandatory field, when NAWDEX_AGCY was blank it was impossible to distribute errors identified for these sites. When the AGCY_STA_NO and station name (STATION_NAME) fields were blank, it was impossible for an agency to determine which site contained the indicated errors.

Because error reports were generated by state and then sorted by the NAWDEX_AGCY and the AGCY_STA_NO, problems arose in distribution. Many federal and interstate agencies have jurisdictions which cover several states but may not coincide with state boundaries. The NAWDEX_AGCY code is the same for these agencies throughout the United States. For example, the U.S. Corps of Engineers (USCE) management boundaries are defined by river basin. Pennsylvania includes parts of the Delaware and Ohio River Basins. The NAWDEX_AGCY code is the same for both the Pittsburgh and Philadelphia USCE offices. If errors were identified in the MWDI at USCE sites in Pennsylvania, it would be impossible to determine to which office the sites belonged. The error reports were mailed to one office in the hope that the office would share the error report for sites not belonging to it with the appropriate office.

NAWDEX DATA BASE ERRORS FOR YOUR AGENCY IN STATE OF AR

AGENCY	SITE ID	STATION NAME	PARAMETER	VALUE
DISCREPANCY				
USGS	07029150	MISSISSIPPI RIVER AT BARFIELD, AR	WRD_ACCT	1
Invalid code (Y,N,BLANK)				
USGS	07032010	MISSISSIPPI R AT W MEMPHIS AR	STATE	5
Site has plotted outside state of AR. Check lat/long				
USGS	07040110	ST FRANCIS RIVER NR PIGGOTT, AR	COMPLETE_STAGE	1
Invalid code (see APPENDIX A,USGS OFR 82-327)				
USGS	07040110	ST FRANCIS RIVER NR PIGGOTT, AR	STAGE_MED	1
Invalid code (see APPENDIX B,USGS OFR 82-327)				
USGS	07047970	MISSISSIPPI RIVER AT HELENA, AR	SW_BEGIN_YR	1827
Invalid date				
USGS	07074490	BLACK RIVER AT JACKSONPORT, AR	COUNTY	67
Site plots outside of COUNTY by 0.001 miles. Lat/long plots in COUNTY 63				
USGS	07261800	BROGAN CREEK NEAR ROVER, AR	HYDROL_UNIT	11110206
Site plots outside of HUC by 11.494 miles. Lat/long plots in HUC 11110203				
USGS	0734131Q	HUDSON CREEK NEAR RED BLUFF, AR	COUNTY	1
Site plots outside of COUNTY by 135.324 miles. Lat/long plots in COUNTY 81				
USGS	07344290	DAYS CREEK SOUTH OF TEXARKANA, AR	HYDROL_UNIT	111449 J
Invalid HUC for state of AR				
USGS	355945090173201	T16N R07E 27ACC1	HYDROL_UNIT	0000000
Invalid HUC for state of AR				

Figure 5. Example of error report.

NAWDEX SITES CONTAINING IDENTICAL LAT/LONG
FOR THE AGENCY USFS
IN STATE OF CO

	AGENCY	LONGITUDE	LATITUDE	SITE ID	STATION NAME
(Case 1)	USFS	105 04 00	37 59 00	128935	ST CHARLES ABOVE LAKE ISABEL
	USFS	105 04 00	37 59 00	128936	LAKE ISABEL INLET
	USFS	105 04 00	37 59 00	128937	LAKE ISABEL OUTLET
	USFS	105 04 00	37 59 00	128901	99999999999999999999999999999999
(Case 2)	USFS	105 09 00	37 19 00	129342	BLUE LAKE INLET
	USFS	105 09 00	37 19 00	129343	BLUE LAKE OUTLET
	USFS	105 09 00	37 19 00	129344	BEAR LAKE INLET
	USFS	105 09 00	37 19 00	129345	BEAR LAKE OUTLET
	USGS	105 41 32	38 00 49	08227500	NORTH CRESTONE CR NR CRESTONE, CO
	USFS	105 41 32	38 00 49	08227500	N CRESTONE CR AT STREAM GAGE
	USFS	105 41 32	38 00 49	095501	N CRESTONE CR AT STREAM GAGE
	USGS	106 01 49	39 47 44	09035900	SO FK OF WILLIAMS FK NR LEAL, CO
	USFS	106 01 49	39 47 44	11062102	SOUTH FORK WILLIAMS FORK
	USGS	106 06 57	38 14 28	08224500	KERBER CR NR VILLA GROVE, CO
	USFS	106 06 57	38 14 28	08227000	SAGAUCHE CR AT STREAM GAGE
	USGS	106 48 05	39 10 48	09073400	ROARING FORK RIVER NEAR ASPEN, CO
	USGS	106 48 05	39 10 48	391048106480502	ROARING FORK RIVER
	USFS	106 48 05	39 10 48	45-001	ROARING FORK NEAR ASPEN
(Case 3)	USGS	106 49 51	37 46 01	08217500	RIO GRANDE AT WAGON WHEEL GAP, CO
	USFS	106 49 51	37 46 01	08217500	RIO GRANDE AT WAGON WHEEL GAP
	USFS	106 49 51	37 46 01	093301	RIO GRANDE AT WAGON WHEEL GAP
	CO007	106 49 51	37 46 01	000135	RIO GRANDE NEAR WAGON WHEEL GAP

Figure 6. Example of error report for sites containing identical geographic coordinates.

NAWDEX SITES MISSING LAT/LONG

FOR THE AGENCY USEPA

IN STATE OF NE

SITE ID	STATION NAME
CUR080	PINE RUN
CUR079	UNNAMED TRIB TO PINE RUN
CUR078	UNNAMED TRIB TO PINE RUN
CUR077	PINE RUN
CUR076	KINGS RUN
CUR075	KINGS RUN
CUR074	KINGS RUN
CUR073	KINGS RUN
CHS190	CHEST CR BELOW WESTOVER
CHS180	CHEST CR AT PINE RUN

Figure 7. Example of an error report for sites missing geographic coordinates.

Table 2. Number of errors by attribute

Attribute	Number of errors	Attribute	Number of errors
COUNTY	38,613	QW_BEGIN_YR	11
HYDROL_UNIT	32,029	QW_END_YR	11
STATE	18,798	PHY_BEGIN_YR	8
LONGITUDE/LATITUDE	10,956	CHM_END_YR	7
STAGE_MED	8,311	GW_BEGIN_YR	7
COMPLETE_STAGE	8,080	BIO_END_YR	6
WRD_ACCT	960	CHM_BEGIN_YR	5
LOW_FLOW	262	SW_END_YR	3
SW_BEGIN_YR	56	BIO_BEGIN_YR	1
		Total	118,135

Table 3. Error rates for agencies contributing more than 1,000 sites

AGENCY	TOTAL SITES	SITES IN ERROR	PERCENT	AGENCY	TOTAL SITES	SITES IN ERROR	PERCENT
USGS	273,251	37,112	13.6	VA001	4,333	439	10.1
USEPA	50,664	11,613	22.9	WI001	3,930	237	6.0
TX001	38,071	2	0.0	NJ002	3,838	1,064	27.7
CA009	16,379	486	3.0	IL006	3,237	262	8.1
PA001	13,002	9,564	73.6	MI001	3,236	545	16.8
SC004	7,496	3,927	52.4	USBR	2,467	272	11.0
FL051	7,343	4,334	59.0	OR009	2,267	1,211	53.4
USCE	7,156	532	7.4	MN012	2,222	136	6.1
USFS	6,643	855	12.9	OK001	1,845	0	0.0
NC004	6,379	1,163	18.2	IA019	1,452	0	0.0
OH004	5,955	512	8.6	AL002	1,451	145	10.0
USTVA	4,676	1,379	29.5	ID004	1,202	114	9.5

A variation of this problem occurred when errors were identified for an agency which had no mailing information in the state. Colorado's USCE sites could belong to one of five offices depending on the river basin; however, none of these offices were located in Colorado.

Conclusions

The results of this project indicate the importance of quality control for a data base. The GIS proved to be an efficient and effective tool for checking the accuracy of the site information. This project demonstrates the ability of the GIS to make analyses that were previously either too difficult or too time consuming to accomplish. Once existing errors in the MWDI are corrected, these programs could easily be adapted and used to insure the accuracy of new site information prior to its acceptance into the MWDI. The NAWDEX_AGCY codes should be expanded to specifically indicate site ownership for federal and interstate agencies.

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APPENDIXES

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Appendix A

```
&args ndxstate
&severity &warning &FAIL
&severity &error &FAIL
&watch ndx_inst.watch
/*****************************************************************************
/* This AML NAWDEX.INSTALL.AML is used to create an ARC/INFO working directory
/* and populate it with NAWDEX data provided from WATSTORE on a 1688 logical
/* record length mag tape. The user has the option of creating a new state
/* directory and populating it with NAWDEX data, updating the data for an
/* existing state or installing NAWDEX data for a new state.
/*
/*  Programmer:
/*                Janice M. Gordon (JMGORDON)
/*                USGS, Pacific Northwest District, WRD
/*                10615 S.E. Cherry Blossom Drive
/*                Portland, OR  97216
/*                Phone: (503) 252-3200
/*
/*  Programs listed below written by:
/*                                     Lenny L. Orzol (LLORZOL)
/*                                     USGS, Pacific Northwest District, WRD
/*                                     10615 S.E. Cherry Blossom Drive
/*                                     Portland, OR  97216
/*                                     Phone: (503) 252-3200
/*
/* The following programs are required in order to execute NAWDEX.INSTALL.AML.
/*   COMPILE.CPL
/*   NAWDEXARC.AML
/*   NAWDEXARC.F77
/*   NAWDEX_COORD.F77
/*
/*
/*  To execute type :
/*    ARC   (or whatever command your system uses to access ARC/INFO.)
/*    &R NAWDEX.INSTALL.AML
/*
/*  Created: 3/91;  Converted to UNIX only 8/91 BJFisher
/*****************************************************************************
&type
&type ============================================================================
&type
&type Disclaimer:
&type
&type Although these programs have been used by the U.S. Geological Survey, no
&type warranty, expressed or implied, is made by the USGS as to the accuracy
&type or fuctioning of these programs. No responsibility is assumed by the
&type USGS in connection with the distribution or use of these programs.
&type
&type ============================================================================
&type
/*
&s .homepath /reach/nawdex
&s seperator /
&amlpath /reach/nawdex/%ndxstate%
&s .statepath /reach/nawdex/%ndxstate%
```

```
&s .prog_path /reach/nawdex/amls/dgprogs%seperator%
&s .path %.statepath%%seperator%
&TYPE
/*
&if [null %ndxstate%] &then &call usage
&workspace %.statepath%
/*          -------------------------
/*********  |CREATE ARC/INFO DATAFILES|**************************************
/*          -------------------------
&TYPE Creating Key files in INFO directory now..
&workspace %.path%info
/*
/*-----------create data for data.link-----------------------------------------
&data cat > data.link.data
QW,QW_DATA,INFO,QW_KEY,QW_KEY,LINK
GW,GW_DATA,INFO,GW_KEY,GW_KEY,LINK
SW,SW_DATA,INFO,SW_KEY,SW_KEY,LINK
BIO,BIO_DATA,INFO,BIO_KEY,BIO_KEY,LINK
PHY,PHY_DATA,INFO,PHY_KEY,PHY_KEY,LINK
SED,SED_DATA,INFO,SED_KEY,SED_KEY,LINK
CHM,CHM_DATA,INFO,CHM_KEY,CHM_KEY,LINK
MET,MET_DATA,INFO,MET_KEY,MET_KEY,LINK
&end
&workspace %.statepath%
/*-------------------------------------------------------------------------
/*
/*
/*----------Creating data.link template---------------------------------------
&DATA ARC INFO
ARC
DELIMETER ,
DEFINE DATA.LINK
RELATION,8,8,C
TABLE-ID,128,128,C
DATABASE,8,8,C
ITEM,16,16,C
COLUMN,32,32,C
TYPE,16,16,C

SEL DATA.LINK
ADD FROM DATA.LINK.DATA
REM
REM-----creating loc.descriptors-----------------------------------------------
DEFINE LOC.DESCRIPTORS
NAWDEX#,4,5,B
NAWDEX_ID,22,22,C
NAWDEX_AGCY,5,5,C
AGCY_STA_NO,15,15,C
STATION_NAME,48,48,C
NON_US_COUNTRY,2,2,C
STATE,3,3,I
COUNTY,3,3,I
HYDROL_UNIT,12,12,I
CONG_DIST,3,3,I
SITE_TYPE,2,2,I
BASIN_DESCRP,3,3,C
WDSD_OFC_CODE,9,9,C
DRAINAGE.AREA,4,10,F,2
NC_AREA,1,1,C
```

```
LAST_UPDATE,6,6,I
STATE_COUNTY,5,5,I
PRIMARY_USE,1,1,C
WRD_ACCT,1,1,C
DOWNSTREAM_ORDER,15,15,C
OTHER_DATA,9,9,C
SW_ACTIVE,1,1,C
SW_KEY,4,5,B
GW_ACTIVE,1,1,C
GW_KEY,4,5,B
QW_ACTIVE,1,1,C
QW_KEY,4,5,B
BIO_ACTIVE,1,1,C
BIO_KEY,4,5,B
PHY_ACTIVE,1,1,C
PHY_KEY,4,5,B
SED_ACTIVE,1,1,C
SED_KEY,4,5,B
CHM_ACTIVE,1,1,C
CHM_KEY,4,5,B
MET_ACTIVE,1,1,C
MET_KEY,4,5,B
MISC_INFO_KEY,4,5,B

REDEFINE
27,DESCRPT1,105,105,C
136,DESCRPT2,39,39,C

REM------creating loc.misc_info template----------------------------------
DEFINE LOC.MISC_INFO
NAWDEX#,4,5,B
PROJECTS,50,50,C
NETWORKS,40,40,C
TOTAL_DOLLARS,6,6,I
SITE_FISCAL_YR,2,2,I
FUNDING,210,200,C
OT_SRC,50,50,C
SOURCE_INFORMATI,120,120,C
SORT1202,8,8,C
KEY-LOC,4,5,B

REDEFINE
5,MISC,478,200,C

REM--------creating loc.naw template-----------------------------------------
DEFINE LOC.NAW
NAWDEX_AGCY,5,5,C

REM--------creating loc.nawdex template--------------------------------------
DEFINE LOC.NAWDEX
NAWDEX_AGCY,5,5,C

REM--------creating nawdex.agcy template-------------------------------------
DEFINE NAWDEX_AGCY
AREA,4,12,F,3
PERIMETER,4,12,F,3
LOC#,4,5,B
LOC-ID,4,5,B
NAWDEX#,4,5,B
```

```
NAWDEX_ID,22,22,C
NAWDEX_AGCY,5,5,C
AGCY_STA_NO,15,15,C
STATION_NAME,48,48,C
NON_US_COUNTRY,2,2,C
STATE,3,3,I
COUNTY,3,3,I
HYDROL_UNIT,12,12,I
CONG_DIST,3,3,I
SITE_TYPE,2,2,I
BASIN_DESCRP,3,3,C
WDSD_OFC_CODE,9,9,C
DRAINAGE.AREA,4,10,F,2
NC_AREA,1,1,C
LAST_UPDATE,6,6,I
STATE_COUNTY,5,5,I
PRIMARY_USE,1,1,C
WRD_ACCT,1,1,C
DOWNSTREAM_OREDER,15,15,C
OTHER_DATA,9,9,C
SW_ACTIVE,1,1,C
SW_KEY,4,5,B
GW_ACTIVE,1,1,C
GW_KEY,4,5,B
QW_ACTIVE,1,1,C
QW_KEY,4,5,B
BIO_ACTIVE,1,1,C
BIO_KEY,4,5,B
PHY_ACTIVE,1,1,C
PHY_KEY,4,5,B
SED_ACTIVE,1,1,C
SED_KEY,4,5,B
CHM_ACTIVE,1,1,C
CHM_KEY,4,5,B
MET_ACTIVE,1,1,C
MET_KEY,4,5,B
MISC_INFO_KEY,4,5,B

REDEFINE
43,DESCRPT1,105,105,C
152,DESCRPT2,39,39,C

REM-----creating loc.use template-------------------------------------------------
DEFINE LOC.USE
PRIMARY_USE,1,1,C

REM------creating loc.year template-------------------------------------------
DEFINE LOC.YEAR
QW_BEGIN_YR,4,4,I

REM------creating qw_data template--------------------------------------------
DEFINE QW_DATA
NAWDEX#,4,5,B
QW_BEGIN_YR,4,4,I
QW_END_YR,4,4,I
QW_INTERRUPTED,1,1,C
QW_OWDC_NO,5,5,C
QW_OWDC_SEC,13,13,C
QW_RECMD_MTHDS,1,1,C
```

```
QW_TELEMETRY,1,1,C
QW_LST_UPDATE,4,4,I
QW_PURPOSE,9,9,C
QW_RECORDER_TYPE,1,1,C
QW_RECORDER_FREQ,1,1,C
QW_PN_CODE,1,1,C
STORET_POINTER,7,7,C
QW_MODIFIERS,80,80,C
KEY-LOC,4,5,B

REDEFINE
5,QW,132,132,C
34,DATEC,4,4,C

REM------creating gw_data template-----------------------------------------------
DEFINE GW_DATA
NAWDEX#,4,5,B
GW_BEGIN_YR,4,4,I
GW_END_YR,4,4,I
GW_INTERRUPTED,1,1,C
GW_OWDC_NO,5,5,C
PRIN_AQUIFER,8,8,C
AQUIFER_TYPE,1,1,C
LEVEL_FREQ,1,1,C
LEVEL_MED,1,1,C
DISCHRG_FREQ,1,1,C
DISCHRG_MED,1,1,C
SUBSIDE_FREQ,1,1,C
SUBSIDE_MED,1,1,C
WELL_DEPTH,5,5,I
GW_RECMD_MTHDS,1,1,C
GW_OTHER,12,12,C
MAJOR_VAR,4,4,C
GW_TELEMETRY,1,1,C
GW_LST_UPDATE,4,4,I
GW_PURPOSE,9,9,C
GW_RECORDER_TYPE,1,1,C
GW_RECORDER_FREQ,1,1,C
GW_PN_CODE,1,1,C
GW_POINTER,80,80,C
KEY-LOC,4,5,B

REDEFINE
5,GW,148,148,C
57,DATEC,4,4,C

REM------creating sw_data template-----------------------------------------------
DEFINE SW_DATA
NAWDEX#,4,5,B
SW_BEGIN_YR,4,4,I
SW_END_YR,4,4,I
SW_INTERRUPTED,1,1,C
SW_OWDC_NO,5,5,C
SW_OWDC_SEQ,13,13,C
COMPLETE,1,1,C
PEAK_STAGE,1,1,C
LOW_STAGE,1,1,C
STAGE_MED,1,1,C
COMPLETE_FLOW,1,1,C
```

```
PEAK_FLOW,1,1,C
LOW_FLOW,1,1,C
MISC_FLOW_MEAS,1,1,C
FLOW_MED,1,1,C
VOLUME,1,1,C
VOLUME_CHANGE,1,1,C
VOLUME_MED,1,1,C
SW_UNIT_FLOW,1,1,C
SW_UNIT_STAGE,1,1,C
SW_UNIT_VOLUME,1,1,C
SW_RECMD_MTHDS,1,1,C
SW_OTHER,12,12,C
SW_TELEMETRY,1,1,C
SW_LST_UPDATE,4,4,I
SW_PURPOSE,9,9,C
SW_RECORDER_TYPE,1,1,C
SW_RECORDER_FREQ,1,1,C
SW_PN_CODE,1,1,C
SW_MODIFIERS,80,80,C
KEY-LOC,4,5,B

REDEFINE
5,SW,152,152,C
61,DATEC,4,4,C

REM----creating bio_data template-----------------------------------------------
DEFINE BIO_DATA
NAWDEX#,4,5,B
ENTERIC_BACT,1,1,C
NATIVE_BACT,1,1,C
PHYTOPLANKTON,1,1,C
ZOOPLANKTON,1,1,C
PERIPHYTON,1,1,C
MACROPHYTON,1,1,C
MICROINVERTS,1,1,C
MACROINVERTS,1,1,C
VERTEBRATES,1,1,C
FUNGI,1,1,C
VIRUSES,1,1,C
BIO_RECMD_MTHDS,1,1,C
BIO_BEGIN_YR,4,4,I
BIO_END_YR,4,4,I
BIO_LST_UPDATE,4,4,I
BIOLOGIC_MED,1,1,C
PRIMARY_PRDCTVTY,1,1,C
SCENDARY_PRDCTV,1,1,C
CHEMOSYNTHETIC_A,1,1,C
BIOSTIMULATORY_T,1,1,C
TOXICITY_TEST,1,1,C
OTHER_BIOASSAY_T,1,1,C
CHM_TISSUE_ANALY,1,1,C
HISTOPATH_ANALYS,1,1,C
OTHER_TISSUE_ANA,1,1,C
BIO_MODIFIERS,80,80,C
KEY-LOC,4,5,B

REDEFINE
5,BIO,114,114,C
25,DATEC,4,4,C
```

```
REM------creating phy_data-----------------------------------------------------
DEFINE PHY_DATA
NAWDEX#,4,5,B
TEMPERATURE,1,1,C
SPEC_CONDUCT,1,1,C
TURBIDITY,1,1,C
COLOR,1,1,C
ODOR,1,1,C
PH,1,1,C
SUSPD_SOLIDS,1,1,C
PHY_RECMD_MTHDS,1,1,C
PHY_BEGIN_YR,4,4,I
PHY_END_YR,4,4,I
PPHY_LST_UPDATE,4,4,I
PHYSICAL_MED,1,1,C
PHY_MODIFIER,80,80,C
KEY-LOC,4,5,B

REDEFINE
5,PHY,101,101,C
21,DATEC,4,4,C

REM---creating sed_data-------------------------------------------------------
DEFINE SED_DATA
NAWDEX#,4,5,B
BED_LOAD,1,1,C
CNCNTRIN_SUS,1,1,C
CNCNTRIN_TOT,1,1,C
PART_SIZ_SUS,1,1,C
PART_SIZ_BED,1,1,C
SED_DIS_SUS,1,1,C
SED_DIS_TOT,1,1,C
SED_RECMD_MTHDS,1,1,C
SED_BEGIN_YR,4,4,I
SED_END_YR,4,4,I
SED_LST_UPDATE,4,4,I
SEDIMENT_MED,1,1,C
SED_MODIFIERS,80,80,C
KEY-LOC,4,5,B

REDEFINE
5,SED,101,101,C
21,DATEC,4,4,C

REM------creating chm_data-----------------------------------------------------
DEFINE CHM_DATA
NAWDEX#,4,5,B
SOLIDS_DIS,1,1,C
MAJOR_IONS,1,1,C
HARDNESS,1,1,C
SILICA,1,1,C
PHOSPHORUS,1,1,C
PHOS_SPECIES,1,1,C
NITROGEN,1,1,C
N_SPECIES,1,1,C
DETERGENTS,1,1,C
OMI_CONSTITS,1,1,C
RADIOACTIVITY,1,1,C
```

```
RCHM_SPECIES,1,1,C
CARBON,1,1,C
ORG_GROUPS,1,1,C
PEST_SPECIES,1,1,C
OTH_ORG_SPECIES,1,1,C
BIOCHEM_OX_DMND,1,1,C
CHEM_OX_DMND,1,1,C
DISSOLVED_OX,1,1,C
OTHER_DIS_GAS,1,1,C
CHEM_RECMD_MTHDS,1,1,C
CHM_BEGIN_YR,4,4,I
CHM_END_YR,4,4,I
CHM_LST_UPDATE,4,4,I
CHEMICAL_MED,1,1,C
CHM_MODIFIERS,80,80,C
KEY-LOC,4,5,B

REDEFINE
5,CHM,114,114,C
34,DATEC,4,4,C

REM-----creating met_data template-----------------------------------------------
DEFINE MET_DATA
NAWDEX#,4,5,B
MET_BEGIN_YR,4,4,I
MET_END_YR,4,4,I
MET_INTERRUPTED,1,1,C
MET_RAINFALL,1,1,C
MET_UNIT_RAINFAL,1,1,C
MET_AIR_TEMPERAT,1,1,C
MET_RSVD1,1,1,C
MET_WIND_VELOCIT,1,1,C
MET_RSVD2,1,1,C
MET_RSVD3,1,1,C
MET_RECMD_MTHDS,1,1,C
MET_OTHER,12,12,C
MET_TELEMETRY,1,1,C
MET_LST_UPDATE,4,4,I
MET_MEDIA,1,1,C
MET_RECORDER_TYP,1,1,C
MET_RECORDER_FRE,1,1,C
MET_PN_CODE,1,1,C
MET_MODIFIERS,80,80,C
KEY-LOC,4,5,B

REDEFINE
5,MET,118,118,C
35,DATEC,4,4,C

REM----creating loc_data template------------------------------------------------
DEFINE LOC_DATA
NAWDEX#,4,5,B
NAWDEX-ID,22,22,C
NAWDEX_AGCY,5,5,C
AGCY_STA_NO,15,15,C
STATION_NAME,48,48,C
NON_US_COUNTRY,2,2,C
STATE,3,3,I
COUNTY,3,3,I
```

```
HYDROL_UNIT,12,12,C
CONG_DIST,3,3,I
SITE_TYPE,2,2,C
BASIN_DESCRP,3,3,I
WDSD_OFC_CODE,9,9,C
DRAIN_AREA,9,9,I
NC_AREA,1,1,C
LAST_UPDATE,6,6,C
STATE_COUNTY,5,5,I
PRIMARY_USE,1,1,C
WRD_ACCT,1,1,C
DOWNSTREAM_ORDER,15,15,C
OTHER_DATA,9,9,C

REM-----creating key_data template-----------------------------------------------
DEFINE KEY_DATA
NAWDEX#,4,5,B
SW_ACTIVE,1,1,C
SW_KEY,4,5,B
GW_ACTIVE,1,1,C
GW_KEY,4,5,B
QW_ACTIVE,1,1,C
QW_KEY,4,5,B
BIO_ACTIVE,1,1,C
BIO_KEY,4,5,B
PHY_ACTIVE,1,1,C
PHY_KEY,4,5,B
SED_ACTIVE,1,1,C
SED_KEY,4,5,B
CHM_ACTIVE,1,1,C
CHM_KEY,4,5,B
MET_ACTIVE,1,1,C
MET_KEY,4,5,B
MISC_INFO_KEY,4,5,B

QUIT
STOP
&END
&workspace %.path%info
rm data.link.data
&workspace %.statepath%
/*
/*****************************************************************************
/*      EXECUTING F77 PROGRAMS - AUTHOR: LLORZOL
/*  These programs will load the nawdex data into the ARC/INFO files.
/*****************************************************************************
/*
&r %.prog_path%nawdex_arc.aml                    /*THIS AML WILL EXECUTE NAWDEXARC.RUN
/*                                  (program to read nawdex data and load into
/*                                  individual INFO files).
/*                                  THIS AML WILL EXECUTE NAWDEX_COORD.AML
/*                                  progam to generate coverage and build and
/*                                  join loc_data to PAT file.
/*
/*
&watch &off
rm nawdex.data
log loc add
NAWDEXARC completed.
```

```
quit     /* leaving arc
rm nawprj.prj
&return
/*==================ROUTINE USAGE=============================================
&routine usage
&watch &off
&type       ================================================================================
&type      |  Usage:    ndx_install <state code>                                             |
&type      |           State code is entered as a 2 char  Ex: or =  Oregon.                  |
&type       ================================================================================
&return;&stop
/*
/*==================ROUTINE QUITOUT===========================================
&routine QUITOUT
&type **** PROGRAM TERMINATED BY USER ****
/*
/*
&watch &off
quit       /* exiting arc/info
/*
&TYPE  ......LEAVING ARC
&return;&stop
```

```
/*C------------------------  AML PROGRAM NAWDEXARC  ------------------------C*/
/************* U.S. Geological Survey preliminary computer program ************
/******************************************************************************
/*************                NAWDEXARC version 2.0                *************
/******************************************************************************
/**          Language: AML ARC Macro Language                                 **
/**             Primos
/**             Sun3, Sun4
/**             DG computers
/**           The source code is available from below:
/*::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::
/*============================================================================
/*     Author/Site,      Date,        Event
/*   ----------------------------------------------------------------------
/*   Leonard L. Orzol    01/22/91   USGS-WRD Portland OR  Original Coding
/*
/*============================================================================
/*::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::
/*
/* Disclaimer:
/*
/*        Although this program has been used by the U.S. Geological Survey,
/*        no warranty, expressed or implied, is made by the USGS as to the
/*        accuracy and functioning of the program and related program
/*        material nor shall the fact of distribution constitute any such
/*        warranty, and no responsibility is assumed by the USGS in
/*        connection therewith.
/*
/*::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::
/*============================================================================
/*
/*  Aml name: Nawdexarc.aml
/*  Language: AML ARC Macro Language
/*::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::
/*
/* Purpose: Enables the user to produce a coverage of nadex sites and related
/*           Arc/Info files carrying nadex information data.
/*
/*::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::
/*
/* Arguments: none
/* Variable name,   Type,    Definition
/* ----------------------------------------------------------------------------
/*::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::
/*
/* History:
/*     Author/Site,      Date,        Event
/*     ---------------------------------------------------------
/*   Leonard Orzol    01/22/91   USGS-WRD Portland OR  Original Coding
/*
/*============================================================================
&severity &warning &routine error_warning
&severity &error &routine error_fail
&s coverage_name loc
&s nawdex_file nawdex.data

&s .separator /
&s version 2.0
&s program nawdexarc
```

```
&s watch_file [show &watch]
&mess &on
&if %watch_file% ne &OFF &then ~
  &do
    &watch %watch_file% &append
    &s watch_flag 1
  &end
&else ~
  &do
    &watch nawdexarc.watch
    &s watch_flag 0
  &end

&call copyright

&if ^ [exists %nawdex_file% -file] &then ~
  &do
    &type \\Nawdex tapefile %nawdex_file% does not exist...\\
    &call failing
  &end


&data %.prog_path%nawdexarc
&end
&call nawdex_link
&call nawdex_cover
&call nawdex_delete
&watch &off
&return
/*
/*
&routine copyright

&severity &warning &routine error_warning
&severity &error &routine error_fail

&type \\Runnning [translate %program%]....\
&type [translate %program%] ver. %version%
&type Copyright USGS_North_West_GIS_Software 1991\
&type                          (^)    (^)
&type     ^    ^     _ ^     ^    (^) (^) 1
&type    ^  -  ^       ^    ^    (^)  (^)
&type     _ ^    ^- ^    ^       1  (^)(^)
&type    ^    ^ _  ^   USGS      (^) 1  1
&type  - ^     ^   North_West   ((^) (^)
&type      ^ ^ _ ^     GIS       /(^)  1
&type  ^    ^^  ^  SOFTWARE   (^) 1(^)
&type    ^  -  ^               1   /(^)

&return
/*
/*      Routine Nawdex_Link
/*
/*:::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::
/*
/* Purpose: Loads related Arc/Info files carrying nawdex information data.
/*
/*:::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::
&routine nawdex_link
```

```
&severity &warning &routine error_warning
&severity &error &routine error_fail

&if [exists nawdex.errfil -file] &then ~
  &do
    &type \\Errors have occurred in previous Fortran program Nawdexarc
    &call failing
  &end

&s data_file loc_data
&call linking
&s data_file key_data
&call linking
&s data_file sw_data
&call linking
&s data_file gw_data
&call linking
&s data_file qw_data
&call linking
&s data_file bio_data
&call linking
&s data_file phy_data
&call linking
&s data_file sed_data
&call linking
&s data_file chm_data
&call linking
&s data_file met_data
&call linking

&return
/*
/*
&routine linking

&severity &warning &routine error_warning
&severity &error &routine error_fail

&if ^ [exists %data_file% -file] &then ~
  &do
    &type \\Missing %data_file% ascii data file
    &call failing
  &end

&if ^ [exist %data_file% -info] &then ~
  &do
    &type \\Missing %data_file% info datafile template
    &call failing
  &end

&call nawdex_load

&return
/*
/*                  Routine Nawdex_Load
/*
/*:::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::
/*
```

```
/* Purpose: Loads related Arc/Info files carrying nadex information data.
/*
/*:::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::
&routine nawdex_load

&severity &warning &routine error_warning
&severity &error &routine error_fail

&type \Loading Arc/Info datafile %data_file% now...
&mes &off &all

&workspace %.statepath%
&workspace info
&data info
ARC
DELIMITER !
SEL [translate %data_file%]
PURGE
Y
ADD FROM %.statepath%/%data_file%
Q STOP
&end
&workspace %.statepath%

&mes &on

&return
/*
/*                          Routine Nawdex_Cover
/*
/*:::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::
/*
/* Purpose: Generates Arc/Info coverage from nawdex longitude and latitude
/*           information data.
/*
/*:::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::
&routine nawdex_cover
&severity &warning &routine error_warning
&severity &error &routine error_fail

&if ^ [exists crd_data -file] &then ~
  &do
    &type \\Nawdex coordinate file crd_data does not exist...\\
    &call failing
  &end

&if ^ [exists %coverage_name% -cover] &then ~
  CREATE %coverage_name%
&else ~
  &do
    KILL %coverage_name%
    CREATE %coverage_name%
  &end

&if [exists nawprj -file] &then ~
  &s delete_status [delete nawprj -file]
&data ARC PROJECT file crd_data nawprj
INPUT
PROJECTION GEOGRAPHIC
```

```
UNITS DMS
QUADRANT NW
PARAMETERS
OUTPUT
PROJECTION ALBERS
UNITS METERS
PARAMETERS
29 30 00
45 30 00
-96 00 00
23 00 00
0.0
0.0
END
&end  /* &data block

&data %.prog_path%nawdex_coord
&end

&data ARC GENERATE %coverage_name%
INPUT nawcrd
POINTS
QUIT
&end   /* &data block
BUILD %coverage_name% POINT

JOINITEM %coverage_name%.PAT loc_data %coverage_name%.PAT $recno ~
 %coverage_name%-id link
JOINITEM %coverage_name%.PAT key_data %coverage_name%.PAT $recno other_data ~
 link

&return
/*
/*      Routine Nawdex_Delete
/*
/*:::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::
/*
/* Purpose: Deletes ASCII data files carrying nadex information data.
/*
/*:::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::
&routine nawdex_delete

&severity &warning &routine error_warning
&severity &error &routine error_fail

&s data_file loc_data
&call deleting
&s data_file key_data
&call deleting
&s data_file sw_data
&call deleting
&s data_file gw_data
&call deleting
&s data_file qw_data
&call deleting
&s data_file bio_data
&call deleting
&s data_file phy_data
&call deleting
```

```
&s data_file sed_data
&call deleting
&s data_file chm_data
&call deleting
&s data_file met_data
&call deleting
&s data_file nawcrd
&call deleting
&s data_file nawprj
&call deleting

&return
/*
/*
&routine deleting

&severity &warning &routine error_warning
&severity &error &routine error_fail

&if [exist %data_file% -file] &then ~
  &s delete_status [delete %data_file% -file]

&return
/*
/*       Routine Failing
/*
&routine failing

&severity &warning &routine error_warning
&severity &error &routine error_fail

&type Bailing out....[translate %program%] Failure....
&watch &off
&stop
/*
&routine usage
&type \\Usage: [translate %program%] <coverage_name> <nawdex_file> {basic_file}
&type         {coverage_name} {core_flag}\\
&watch &off
&stop
/*
&routine error_warning
&severity &error &ignore
&return
/*
&routine error_fail
&severity &error &ignore
&type Bailing out....[translate %program%] Failure....
&watch &off
&stop
```

```
      PROGRAM NAWDEXARC
C************* U.S. Geological Survey preliminary computer program ************
C*****************************************************************************
C*************                Nawdexarc version 2.0                 *************
C*****************************************************************************
C**          Language: Fortran 77                                              **
C**          Program must be recompiled then bind with system libraries        **
C**             Primos
C**             Sun3, Sun4
C**             DG computers
C**           The source code is available from below:
C*:::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::
C*=============================================================================
C*     Author/Site,      Date,        Event
C*   ---------------------------------------------------------------------------
C*   Leonard L. Orzol    01/22/91   USGS-WRD Portland OR  Original Coding
C*
C*=============================================================================
C*:::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::
C*
C* Disclaimer:
C*
C*        Although this program has been used by the U.S. Geological Survey,
C*        no warranty, expressed or implied, is made by the USGS as to the
C*        accuracy and functioning of the program and related program
C*        material nor shall the fact of distribution constitute any such
C*        warranty, and no responsibility is assumed by the USGS in
C*        connection therewith.
C*
C*:::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::
C-------------------------------------------------------------------------
C
C---VERSION 2.0 NAWDEXARC 01JANUARY1991
C
C:::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::
C
C .. Purpose:
C
C     Reads the Nadex tape file and generates the following files:
C      a) latitude-longitude file for projecting into user defined
C      coordinates; b) list of nawdex ids which will later be combined
C      with the projected coordinated and input into the arc "generate"
C      command; c) location file that includes the nawdex description
C      of each site; d) surface_water file that describes the
C      surface-water hydrologics; e) ground_water file that describes the
C      ground-water hydrologics;  f) water_quality file that describes the
C      water-quality parameters; g) biologic file that describes the
C      biologic parameters; h) physical file file that describes the
C      physical characteristic; i) sediment file that describes the
C      sediment hydrologics; j) chemical file that describes the
C      water chemistry characteristics; k) meteorological file that
C      describes the meteorological characteristics.
C
C:::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::
C
C .. Language: FORTRAN, with ARC/INFO subroutine call version 5.01
C
C
C .   Inputs:
```

```
C
C    Outputs:
C
C     Program:
C
C      Variables:
C
C     IOUT     : FORTRAN UNIT NUMBER FOR OUTPUT DATA FILE
C     ITALK    : FLAG FOR INTERACTIVE DIALOG
C              => 1 NON-INTERACTIVE DIALOG
C              => 0 INTERACTIVE DIALOG
C     MAXARC   : MAXIMUM DIMENSION OF THE NUMBER OF ARCS
C     NROW     : NUMBER OF ROWS IN GRID
C     NSTAT    : STATUS OF FILE
C              => 1 OLD FILE
C              => 2 NEW FILE
C              => 3 SCRATCH FILE (DELETED AUTOMATICALLY WHEN RUN ENDS)
C              => 4 UNDETERMINED STATUS (MAY OR MAY NOT EXIST)
C                    IF IT DOES NOT EXIST, IT IS CREATED BY OPEN STATEMENT
C                    IF IT DOES EXIST, IT IS OPENED AS 'OLD' FILE
C     NUNIT    : FORTRAN UNIT NUMBER
C
C .. History:
C
C      Leonard L. Orzol      01/22/91      Original Coding.
C                                          USGS WRD Portland, Or
C                                          Fts: 429-2256
C      Leonard L. Orzol      01/22/91      Coding for Sun 4110.
C
C
C-----------------------------------------------------------------------
C        SPECIFICATIONS:
C     ------------------------------------------------------------------
C
      PARAMETER (MAXFIL=14,NFLAGS=11)
C
      CHARACTER*80 FILNAM(MAXFIL),NAWOUT,NAWFIL,ERRFIL
      CHARACTER*22 NAWID
      CHARACTER*1 DEFALT
C
C      CHARACTER*478 BUFFND
      CHARACTER*195 BUFLOC
      CHARACTER*148 BUFGW
      CHARACTER*152 BUFSW
      CHARACTER*132 BUFQW
      CHARACTER*114 BUFBIO,BUFCHM
      CHARACTER*101 BUFPHY,BUFSED
      CHARACTER*38 BUFMET
      CHARACTER*1 NAWACT(NFLAGS)
C
      INTEGER IUNIT(MAXFIL),NAWFLG(NFLAGS),NAWKEY(NFLAGS)
C
      DATA (FILNAM(N), N=1,MAXFIL)
     &     /'nawdex.data','loc_data','crd_data','key_data','sw_data',
     &      'gw_data','qw_data','bio_data','phy_data','sed_data',
     &      'chm_data','met_data','nawdex.out','nawdex.errfil'/
      DATA (IUNIT(N), N=1,MAXFIL)
     &      /7,8,9,10,11,12,13,14,15,16,17,18,50,60/
C
```

```
C*******************************************************************C
C<><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><C
C                  Open Nawdex reporting and error files
C<><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><C
C1******************************************************************C
C
C1A-----Open reporting file
C
      NSTAT=2
      ITALK=1
      IOUT=IUNIT(MAXFIL-1)
      NAWOUT=FILNAM(MAXFIL-1)
      CALL DELETE_FILE (NAWOUT,*9999)
      CALL OPEN_FILE (IOUT,NAWOUT,NSTAT,ITALK,*9999)
C
C1B-----Delete and open error file
C
      NSTAT=2
      ITALK=1
      IERROR=IUNIT(MAXFIL)
      ERRFIL=FILNAM(MAXFIL)
      CALL DELETE_FILE (ERRFIL,*9999)
      CALL OPEN_FILE (IERROR,ERRFIL,NSTAT,ITALK,*9999)
C*******************************************************************C
C<><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><C
C                Open Nawdex tape file and output data files
C<><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><C
C2******************************************************************C
C
C2A-----Open Nawdex tape file
C
      NAWFIL=FILNAM(1)
      NSTAT=1
      ITALK=1
      CALL OPEN_FILE (IUNIT(1),FILNAM(1),NSTAT,ITALK,*9999)
C
C2B-----Delete then open Nawdex output files
C
      DO 200 N=2,MAXFIL-2
         NSTAT=2
         ITALK=1
         CALL DELETE_FILE (FILNAM(N),*9999)
         CALL OPEN_FILE (IUNIT(N),FILNAM(N),NSTAT,ITALK,*9999)
  200 CONTINUE
C*******************************************************************C
C<><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><C
C                        BANNER OPERATIONS
C<><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><C
C3******************************************************************C
      CALL NAW_BAN (
     I              IOUT,
     I              NAWFIL
     &             )
C
C*******************************************************************C
C<><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><C
C                   READ NAWDEX INFORMATION SECTION
C<><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><C
C4******************************************************************C
```

```
C
C4A----Set Nawdex counter data-themes to zero
C
      DO 400 N=1,NFLAGS
         NAWKEY(N)=0
  400 CONTINUE
C
      NAWSW=0
      NAWGW=0
      NAWQW=0
      NAWBIO=0
      NAWPHY=0
      NAWSED=0
      NAWCHM=0
      NAWMET=0
      NAWSEQ=0
C
C4C---Set Nawdex default null character
C
      DEFALT=''
      IDEFLT=ICHAR(DEFALT)
      PRINT *,IDEFLT
      DEFALT='9'
C
C4B---Read Nawdex tapefile NAWFIL
C
    2 READ(IUNIT(1),'(T28,A195,
     S                A152,
     G                A148,
     Q                A132,
     B                A114,
     P                A101,
     S                A101,
     C                A114,
     F                TR478,
     M                A38,TR36)',
     E                ERR=9990,END=1302)
     &                        BUFLOC,BUFSW,BUFGW,BUFQW,
     &                        BUFBIO,
     &                        BUFPHY,BUFSED,BUFCHM,
     &                        BUFMET
       NAWSEQ=NAWSEQ+1
C
C4C----Set Nawdex output flags
C
      DO 410 N=1,NFLAGS
         NAWACT(N)=''
         NAWFLG(N)=0
  410 CONTINUE
C*****************************************************************C
C<><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><C
C                  READ NAWDEX LOCATION DESCRIPTION SECTION
C<><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><C
C5****************************************************************C
      CALL NAW_LOC (
     I              IUNIT(2),
     I              IUNIT(3),
     I              IDEFLT,DEFALT,
     I              BUFLOC,
```

```
     I              NAWSEQ,
     B              NAWFLG,NFLAGS,
     O              NAWID,
     O              NAWACT)
C*********************************************************************C
C<><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><C
C                  READ NAWDEX SURFACE_WATER SECTION
C<><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><C
C6********************************************************************C
      IF(NAWFLG(4).GE.1) THEN
         NAWSW=NAWSW+1
         NAWKEY(4)=NAWSW
         CALL NAW_SW  (
     I                  IUNIT(5),
     I                  IDEFLT,DEFALT,
     I                  BUFSW,
     I                  NAWSEQ
     &                 )
      ELSE
         NAWKEY(4)=-9999
      ENDIF
C*********************************************************************C
C<><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><C
C                  READ NAWDEX GROUND_WATER SECTION
C<><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><C
C7********************************************************************C
      IF(NAWFLG(5).GE.1) THEN
         NAWGW=NAWGW+1
         NAWKEY(5)=NAWGW
         CALL NAW_GW (
     I                 IUNIT(6),
     I                 IDEFLT,DEFALT,
     I                 BUFGW,
     I                 NAWSEQ
     &                )
      ELSE
         NAWKEY(5)=-9999
      ENDIF
C*********************************************************************C
C<><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><C
C                READ NAWDEX WATER_QUALITY SECTION
C<><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><C
C8********************************************************************C
      IF(NAWFLG(6).GE.1) THEN
         NAWQW=NAWQW+1
         NAWKEY(6)=NAWQW
         CALL NAW_QW (
     I                 IUNIT(7),
     I                 IDEFLT,DEFALT,
     I                 BUFQW,
     I                 NAWSEQ
     &                )
      ELSE
         NAWKEY(6)=-9999
      ENDIF
C*********************************************************************C
C<><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><C
C               READ NAWDEX BIOLOGICAL CHARACTERISTICS SECTION
C<><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><C
```

```
C9*********************************************************************C
      IF(NAWFLG(7).GE.1) THEN
         NAWBIO=NAWBIO+1
         NAWKEY(7)=NAWBIO
         CALL NAW_BIO (
     I                  IUNIT(8),
     I                  IDEFLT,DEFALT,
     I                  BUFBIO,
     I                  NAWSEQ
     &                 )
      ELSE
         NAWKEY(7)=-9999
      ENDIF
C*********************************************************************C
C<><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><C
C              READ NAWDEX PHYSICAL CHARACTERISTICS SECTION
C<><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><C
C10********************************************************************C
      IF(NAWFLG(8).GE.1) THEN
         NAWPHY=NAWPHY+1
         NAWKEY(8)=NAWPHY
         CALL NAW_PHY (
     I                  IUNIT(9),
     I                  IDEFLT,DEFALT,
     I                  BUFPHY,
     I                  NAWSEQ
     &                 )
      ELSE
         NAWKEY(8)=-9999
      ENDIF
C*********************************************************************C
C<><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><C
C                  READ NAWDEX WATER_SEDIMENT SECTION
C<><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><C
C11********************************************************************C
      IF(NAWFLG(9).GE.1) THEN
         NAWSED=NAWSED+1
         NAWKEY(9)=NAWSED
         CALL NAW_SED (
     I                  IUNIT(10),
     I                  IDEFLT,DEFALT,
     I                  BUFSED,
     I                  NAWSEQ
     &                 )
      ELSE
         NAWKEY(9)=-9999
      ENDIF
C*********************************************************************C
C<><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><C
C                  READ NAWDEX CHEMICAL SECTION
C<><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><C
C12********************************************************************C
      IF(NAWFLG(10).GE.1) THEN
         NAWCHM=NAWCHM+1
         NAWKEY(10)=NAWCHM
         CALL NAW_CHM (
     I                  IUNIT(11),
     I                  IDEFLT,DEFALT,
     I                  BUFCHM,
```

```
     I                NAWSEQ
     &               )
      ELSE
         NAWKEY(10)=-9999
      ENDIF
C*********************************************************************C
C<><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><>C
C                  READ NAWDEX METEOROLOGICAL SECTION
C<><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><>C
C13********************************************************************C
      IF(NAWFLG(11).GE.1) THEN
         NAWMET=NAWMET+1
         NAWKEY(11)=NAWMET
         CALL NAW_MET (
     I                IUNIT(12),
     I                IDEFLT,DEFALT,
     I                BUFMET,
     I                NAWSEQ
     &               )
      ELSE
         NAWKEY(11)=-9999
      ENDIF
C*********************************************************************C
C<><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><>C
C                  READ NAWDEX ACTIVE_KEY SECTION
C<><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><>C
C14********************************************************************C
      CALL NAW_KEY (
     I               IUNIT(4),
     I               NAWSEQ,
     I               NAWACT,
     I               NAWKEY,
     I               NFLAGS
     &              )
C*********************************************************************C
C<><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><>C
C               WRITE NAWDEX REPORTING INFORMATION SECTION
C<><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><>C
C15********************************************************************C
      CALL NAW_OUT (
     I               IOUT,
     I               NAWSEQ,
     I               NAWID,
     I               NAWFLG,
     I               NFLAGS
     &              )
       GO TO 2
C*********************************************************************C
C<><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><>C
C                        CLOSE NAWDEX FILES
C<><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><>C
C13********************************************************************C
 1302 DO 1400 M=1,MAXFIL-1
         CALL CLOSE_FILE (FILNAM(M),*9999)
 1400 CONTINUE
C
      IF(NAWSEQ.LE.0) THEN
         WRITE (*,*) 'No Nawdex stations found on tape'
         WRITE (IERROR,*) 'No Nawdex stations found on tape'
```

```
         GO TO 9999
      ELSE
         CALL CLOSE_FILE (ERRFIL,*9999)
         CALL DELETE_FILE (ERRFIL,*9999)
         STOP
      ENDIF
C*********************************************************************C
C                  ERRORS WITHIN NAWDEXARC PROGRAMS
CE********************************************************************C
 9990 WRITE(*,*)
     &        'Unable to read from',FILNAM(1) (1:INDEX(FILNAM(1),' ')-1)
      WRITE(IERROR,*)
     &        'Unable to read from',FILNAM(1) (1:INDEX(FILNAM(1),' ')-1)
      WRITE(*,*) 'Abnormal termination of Nawdex_Arc_Program'
      WRITE(IERROR,*)'Abnormal Termination of Nawdex_Arc_Program'
      CALL CLOSE_FILE(ERRFIL,*9999)
      STOP
 9991 WRITE(*,*) 'End-of-file',FILNAM(1) (1:INDEX(FILNAM(1),' ')-1)
      WRITE(IERROR,*)
     &                'End-of-file',FILNAM(1) (1:INDEX(FILNAM(1),' ')-1)
      WRITE(*,*) 'Abnormal termination of Nawdex_Arc_Program'
      WRITE(IERROR,*)'Abnormal Termination of Nawdex_Arc_Program'
      CALL CLOSE_FILE(ERRFIL,*9999)
      STOP
 9999 WRITE(*,*)'Abnormal Termination of Nawdex_Arc_Program'
      WRITE(IERROR,*)'Abnormal Termination of Nawdex_Arc_Program'
C*********************************************************************C
C                  EXITING NAWDEXARC PROGRAM
C*********************************************************************C
C
      STOP
      END
      SUBROUTINE NAW_BAN (
     I                     IOUT,
     I                     NAWFIL
     &                    )
C---------------------------------------------------------------------
C
C---VERSION 2.00 NAW_BAN 01JANUARY1991
C
C:::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::
C
C .. Purpose:
C
C     Writes operation information to nawdex.out file during the
C      Nawdex_arc program.
C
C:::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::
C
C .. Language: FORTRAN, with ARC/INFO subroutine call version 5.0
C
C
C    Inputs:
C
C     IOUT    : UNIT NUMBER FOR NAWDEX REPORTING FILE
C     NAWFIL  : NAWDEX REPORTING FILE NAME
C
C    Outputs: None
C
```

```
C .. History:
C
C      Leonard L. Orzol      01/22/91      Original Coding.
C                                          USGS WRD Portland, Or
C                                          Fts: 429-2256
C      Leonard L. Orzol      01/22/91      Coding for Sun 4110.
C
C-----------------------------------------------------------------------
C
C        SPECIFICATIONS:
C     ------------------------------------------------------------------
C
      INTEGER IOUT
C
      CHARACTER*(*) NAWFIL
C
C     ------------------------------------------------------------------
C
C1----Write banner to operations file nawdex.out
C
      WRITE(IOUT,1)
    1  FORMAT(1H1,27X,'U.S. GEOLOGICAL SURVEY PROGRAM NAWDEX_ARC',/,
     &        20X,'-- NAWDEX_COVERAGE_PACKAGE,',
     &        'VERSION 2.0, 01/22/91 --',//)
C
C2----Write Nawdexarc label header
C
      WRITE(IOUT,201) NAWFIL (1:INDEX(NAWFIL,' ')-1)
  201  FORMAT(15X,'NAWDEX STATION INFORMATION LIST FROM ',A,/,
     &        10X,70('-'),/,
     &        10X,'NAWDEX#',10X,'NAWDEX SITE-ID',20X,'DATA OUTPUT',/,
     &        10X,70('-'),/,
     &        55X,'|L|K|C|S|G|Q|B|P|S|C|M|',/
     &        55X,'|O|E|R|W|W|W|I|H|E|H|E|',/
     &        55X,'|C|Y|D| | | |O|Y|D|M|T|',/
     &        10X,70('-'))
C*********************************************************************C
C<><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><C
C                  Return to Calling Program
C<><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><C
C*********************************************************************C
 1000 RETURN
      END
      SUBROUTINE NAW_LOC (
     I                    IOUT1,
     I                    IOUT2,
     I                    IDEFLT,DEFALT,
     I                    BUFLOC,
     I                    NAWSEQ,
     B                    NAWFLG,NFLAGS,
     O                    NAWID,
     O                    NAWACT)
C-----------------------------------------------------------------------
C
C---VERSION 2.0 NAW_LOC 01JANUARY1991
C
C:::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::
C
C .. Purpose:
```

```
C
C     Reads the Nadex tape file and generates the following files:
C      a) latitude-longitude file for projecting into user defined
C      coordinates; b) list of nawdex ids which will later be combined
C      with the projected coordinated and input into the arc "generate"
C      command.
C
C:::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::
C
C .. Language: FORTRAN, with ARC/INFO subroutine call version 5.0
C
C
C    Inputs:
C
C     BUFLOC   : CHARACTER BUFFER CONTAINING STATION DATA
C     DEFALT   : DEFAULT CHARACTER (CURRENTLY SET TO 9)
C     IDEFLT   : DEFAULT LENGTH
C     IOUT1    : FORTRAN UNIT NUMBER FOR NAWDEX LOC_DATA ASCII FILE
C     IOUT1    : FORTRAN UNIT NUMBER FOR NAWDEX KEY_DATA ASCII FILE
C     IOUT1    : FORTRAN UNIT NUMBER FOR NAWDEX CRD_DATA ASCII FILE
C     NAWSEQ   : NAWDEX SEQUENCE NUMBER
C
C    Outputs:
C
C     NAWFLG   : INTEGER ARRAY CONTAINING ACTIVE_FLAGS
C              => 1 DATA-THEME IS ACTIVE ENTER APPROPIATE RECORD
C              => 0 DATA-THEME IS INACTIVE
C     NAWID    : NAWDEX STATION-ID
C     NAWACT   : CHARACTER*1 ARRAY CONTAINING ACTIVE_FLAGS
C     NFLAGS   : NUMBER OF ACTIVE_FLAGS
C
C .. History:
C
C      Leonard L. Orzol      01/22/91      Original Coding.
C                                          USGS WRD Portland, Or
C                                          Fts: 429-2256
C      Leonard L. Orzol      01/22/91      Coding for Sun 4110.
C
C-----------------------------------------------------------------------
C
C       SPECIFICATIONS:
C     ------------------------------------------------------------------
C
      PARAMETER (MAXITM=30)
C
      INTEGER IOUT1,IOUT2,IDEFLT,NAWSEQ,
     &        NAWFLG(NFLAGS),
     &        STRCOL(MAXITM),NUMCHR(MAXITM),FINCOL(MAXITM)
C
      CHARACTER*195 BUFLOC
      CHARACTER*22 NAWID
      CHARACTER*7 BUFLNG
      CHARACTER*6 BUFLAT
      CHARACTER*1 NAWACT(NFLAGS),DEFALT
C
      DATA (STRCOL(N), N=1,MAXITM)
     &            /1,23,29,36,41,56,104,106,109,112,124,127,129,132,141,
     &             150,151,157,162,163,164,179,188,189,190,191,192,193,
     &             194,195/
```

```
      DATA (NUMCHR(N), N=1,MAXITM)
     &            /22,6,7,5,15,48,2,3,3,12,3,2,3,9,9,1,6,5,1,1,15,9,8*1/
C     ------------------------------------------------------------------
C
C1----Read Nawdex location information
C
       NAWID=BUFLOC (1:22)
        BUFLAT=BUFLOC (23:28)
         BUFLNG=BUFLOC (29:35)
C
C2----Loop to check Nawdex buffer for missing information
C
      DO 200 N=4,30
         NUMSTR=STRCOL(N)
         NUMFIN=NUMSTR+NUMCHR(N)-1
         FINCOL(N)=NUMFIN
         CALL NAW_DFT (
     I                 NUMCHR(N),
     I                 IDEFLT,DEFALT,
     B                 BUFLOC (NUMSTR:NUMFIN)
     &                 )
  200 CONTINUE
C
C3----Write Nawdex location information
C
      WRITE(IOUT1,'(I5,''!'',20(A,''!''))')
     &           NAWSEQ,BUFLOC (1:22),
     &           (BUFLOC (STRCOL(N):FINCOL(N)), N=4,22)
C
C4----Write Nawdex longitude-latitude information
C
      WRITE(IOUT2,'(A3,2(1X,A2),5X,3(A2,1X))')
     &            BUFLNG (1:3),BUFLNG (4:5),BUFLNG (6:7),
     &            BUFLAT (1:2),BUFLAT (3:4),BUFLAT (5:6)
C
C5----Loop to check Nawdex active_flags
C
      NAWFLG(1)=1
      NAWACT(1)=''
      NAWFLG(2)=1
      NAWACT(2)=''
      NAWFLG(3)=1
      NAWACT(3)=''
      NFLAG=3
C
      DO 500 N=23,30
         NFLAG=NFLAG+1
         NUMSTR=STRCOL(N)
         NAWACT(NFLAG)=BUFLOC (NUMSTR:NUMSTR)
       IF(NAWACT(NFLAG).EQ.'Y') THEN
          NAWFLG(NFLAG)=1
       ELSE IF(NAWACT(NFLAG).EQ.'N') THEN
          NAWFLG(NFLAG)=9
       ELSE
          NAWFLG(NFLAG)=-9999
       ENDIF
  500 CONTINUE
C*********************************************************************C
C<><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><C
```

```
C                  Return to Calling Program
C<><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><>C
C************************************************************************C
 1000 RETURN
      END
      SUBROUTINE NAW_SW  (
     I                    IOUT,
     I                    IDEFLT,DEFALT,
     I                    BUFSW,
     I                    NAWSEQ
     &                   )
C------------------------------------------------------------------------
C
C---VERSION 2.0 NAW_SW  01JANUARY1991
C
C::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::
C
C .. Purpose:
C
C     Reads the Nadex tape file and generates the following file:
C      surface_water file.
C
C::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::
C
C .. Language: FORTRAN, with ARC/INFO subroutine call version 5.0
C
C
C    Inputs:
C
C     BUFSW   : CHARACTER BUFFER CONTAINING NAWDEX DATA
C     DEFALT  : DEFAULT CHARACTER (CURRENTLY SET TO 9)
C     IDEFLT  : DEFAULT LENGTH
C     IOUT    : FORTRAN UNIT NUMBER FOR NAWDEX SW_DATA FILE
C     NAWSEQ  : NAWDEX SEQUENCE NUMBER
C
C    Outputs:
C
C .. History:
C
C      Leonard L. Orzol      01/22/91      Original Coding.
C                                          USGS WRD Portland, Or
C                                          Fts: 429-2256
C      Leonard L. Orzol      01/22/91      Coding for Sun 4110.
C
C--------------------------------------------------------------------------
C
C        SPECIFICATIONS:
C     -------------------------------------------------------------------
C
      PARAMETER (MAXITM=29)
C
      INTEGER IOUT,NAWSEQ,
     &        STRCOL(MAXITM),NUMCHR(MAXITM),FINCOL(MAXITM)
C
      CHARACTER*152 BUFSW
      CHARACTER*1 DEFALT
C
      DATA (STRCOL(N), N=1,MAXITM)
     &            /1,5,9,10,15,29,29,30,29,32,33,34,35,36,37,38,39,40,
```

```
     &             41,42,43,44,56,57,61,70,71,72,73/
      DATA (NUMCHR(N), N=1,MAXITM) /4,4,1,5,13,16*1,12,1,4,9,3*1,80/
C
C     ------------------------------------------------------------------
C
C1----Loop to check Nawdex buffer for missing information
C
      DO 100 N=1,29
         NUMSTR=STRCOL(N)
         NUMFIN=NUMSTR+NUMCHR(N)-1
         FINCOL(N)=NUMFIN
         CALL NAW_DFT (
     I                 NUMCHR(N),
     I                 IDEFLT,DEFALT,
     B                 BUFSW (NUMSTR:NUMFIN)
     &                 )
  100 CONTINUE
C
C2----Write Nawdex location information
C
      WRITE(IOUT,'(I5,29(''!'',A),''!99999!'')')
     &           NAWSEQ,
     &           (BUFSW (STRCOL(N):FINCOL(N)), N=1,29)
C*******************************************************************C
C<><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><C
C                  Return to Calling Program
C<><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><C
C*******************************************************************C
 1000 RETURN
      END
      SUBROUTINE NAW_GW  (
     I                    IOUT,
     I                    IDEFLT,DEFALT,
     I                    BUFGW,
     I                    NAWSEQ
     &                   )
C-------------------------------------------------------------------
C
C---VERSION 2.0 NAW_GW  01JANUARY1991
C
C:::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::
C
C .. Purpose:
C
C     Reads the Nadex tape file and generates the following file:
C      surface_water file.
C
C:::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::
C
C .. Language: FORTRAN, with ARC/INFO subroutine call version 5.0
C
C
C    Inputs:
C
C     BUFGW   : CHARACTER BUFFER CONTAINING NAWDEX DATA
C     DEFALT  : DEFAULT CHARACTER (CURRENTLY SET TO 9)
C     IDEFLT  : DEFAULT LENGTH
C     IOUT    : FORTRAN UNIT NUMBER FOR NAWDEX GW_DATA FILE
C     NAWSEQ  : NAWDEX SEQUENCE NUMBER
```

```
C
C    Outputs:
C
C .. History:
C
C      Leonard L. Orzol      01/22/91      Original Coding.
C                                          USGS WRD Portland, Or
C                                          Fts: 429-2266
C      Leonard L. Orzol      01/22/91      Coding for Sun 4110.
C
C-----------------------------------------------------------------------
C
C        SPECIFICATIONS:
C     -----------------------------------------------------------------
C
      PARAMETER (MAXITM=23)
C
      INTEGER IOUT,NAWSEQ,
     &        STRCOL(MAXITM),NUMCHR(MAXITM),FINCOL(MAXITM)
C
      CHARACTER*148 BUFGW
      CHARACTER*1 DEFALT
C
      DATA (STRCOL(N), N=1,MAXITM)
     &             /1,5,9,10,15,23,24,25,26,27,28,29,30,35,36,48,52,53,
     &             57,66,67,68,69/
      DATA (NUMCHR(N), N=1,MAXITM)
     &             /4,4,1,5,8,7*1,5,1,12,4,1,4,9,3*1,80/
C
C     -----------------------------------------------------------------
C
C1----Loop to check Nawdex buffer for missing information
C
      DO 100 N=1,23
         NUMSTR=STRCOL(N)
         NUMFIN=NUMSTR+NUMCHR(N)-1
         FINCOL(N)=NUMFIN
         CALL NAW_DFT (
     I                 NUMCHR(N),
     I                 IDEFLT,DEFALT,
     B                 BUFGW (NUMSTR:NUMFIN)
     &                )
  100 CONTINUE
C
C2----Write Nawdex location information
C
      WRITE(IOUT,'(I5,23(''!'',A),''!99999!'')')
     &           NAWSEQ,
     &           (BUFGW (STRCOL(N):FINCOL(N)), N=1,23)
C*********************************************************************C
C<><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><>C
C                  Return to Calling Program
C<><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><>C
C*********************************************************************C
 1000 RETURN
      END
      SUBROUTINE NAW_QW  (
     I                    IOUT,
     I                    IDEFLT,DEFALT,
```

```
     I                    BUFQW,
     I                    NAWSEQ
     &                   )
C-------------------------------------------------------------------------
C
C---VERSION 2.0 NAW_QW  01JANUARY1991
C
C:::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::
C
C .. Purpose:
C
C     Reads the Nadex tape file and generates the following file:
C      water_quality file (qw_data).
C
C:::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::
C
C .. Language: FORTRAN, with ARC/INFO subroutine call version 5.0
C
C
C    Inputs:
C
C     BUFQW   : CHARACTER BUFFER CONTAINING NAWDEX DATA
C     DEFALT  : DEFAULT CHARACTER (CURRENTLY SET TO 9)
C     IDEFLT  : DEFAULT LENGTH
C     IOUT    : FORTRAN UNIT NUMBER FOR NAWDEX QW_DATA FILE
C     NAWSEQ  : NAWDEX SEQUENCE NUMBER
C
C    Outputs:
C
C .. History:
C
C      Leonard L. Orzol      01/22/91      Original Coding.
C                                          USGS WRD Portland, Or
C                                          Fts: 429-2256
C      Leonard L. Orzol      01/22/91      Coding for Sun 4110.
C
C-------------------------------------------------------------------------
C
C        SPECIFICATIONS:
C     ---------------------------------------------------------------
C
      PARAMETER (MAXITM=14)
C
      INTEGER IOUT,NAWSEQ,
     &        STRCOL(MAXITM),NUMCHR(MAXITM),FINCOL(MAXITM)
C
      CHARACTER*132 BUFQW
      CHARACTER*1 DEFALT
C
      DATA (STRCOL(N), N=1,MAXITM)
     &            /1,5,9,10,15,28,29,30,34,43,44,45,46,53/
      DATA (NUMCHR(N), N=1,MAXITM) /4,4,1,5,6,1,1,4,9,3*1,7,80/
C
C     ---------------------------------------------------------------
C
C1----Loop to check Nawdex buffer for missing information
C
      DO 100 N=1,14
         NUMSTR=STRCOL(N)
```

```
        NUMFIN=NUMSTR+NUMCHR(N)-1
        FINCOL(N)=NUMFIN
        CALL NAW_DFT (
     I                NUMCHR(N),
     I                IDEFLT,DEFALT,
     B                BUFQW (NUMSTR:NUMFIN)
     &               )
  100 CONTINUE
C
C2----Write Nawdex location information
C
      WRITE(IOUT,'(I5,14(''!'',A),''!9999!'')')
     &           NAWSEQ,
     &           (BUFQW (STRCOL(N):FINCOL(N)), N=1,14)
C*********************************************************************C
C<><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><>C
C                  Return to Calling Program
C<><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><>C
C*********************************************************************C
 1000 RETURN
      END
      SUBROUTINE NAW_BIO  (
     I                    IOUT,
     I                    IDEFLT,DEFALT,
     I                    BUFBIO,
     I                    NAWSEQ
     &                   )
C----------------------------------------------------------------------
C
C---VERSION 2.0 NAW_BIO  01JANUARY1991
C
C::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::
C
C .. Purpose:
C
C     Reads the Nadex tape file and generates the following file:
C      biological file (bio_data).
C
C::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::
C
C .. Language: FORTRAN, with ARC/INFO subroutine call version 5.0
C
C
C    Inputs:
C
C     BUFBIO  : CHARACTER BUFFER CONTAINING NAWDEX DATA
C     DEFALT  : DEFAULT CHARACTER (CURRENTLY SET TO 9)
C     IDEFLT  : DEFAULT LENGTH
C     IOUT    : FORTRAN UNIT NUMBER FOR NAWDEX BIO_DATA FILE
C     NAWSEQ  : NAWDEX SEQUENCE NUMBER
C
C    Outputs:
C
C .. History:
C
C      Leonard L. Orzol      01/22/91      Original Coding.
C                                          USGS WRD Portland, Or
C                                          Fts: 429-2256
C      Leonard L. Orzol      01/22/91      Coding for Sun 4110.
```

```
C
C-----------------------------------------------------------------------
C
C        SPECIFICATIONS:
C     ------------------------------------------------------------------
C
      PARAMETER (MAXITM=26)
C
      INTEGER IOUT,NAWSEQ,
     &        STRCOL(MAXITM),NUMCHR(MAXITM),FINCOL(MAXITM)
C
      CHARACTER*114 BUFBIO
      CHARACTER*1 DEFALT
C
      DATA (STRCOL(N), N=1,MAXITM)
     &             /1,2,3,4,5,6,7,8,9,10,11,12,13,17,21,25,26,27,28,29,
     &             30,31,32,33,34,35/
      DATA (NUMCHR(N), N=1,MAXITM) /12*1,3*4,10*1,80/
C
C     ------------------------------------------------------------------
C
C1----Loop to check Nawdex buffer for missing information
C
      DO 100 N=1,26
         NUMSTR=STRCOL(N)
         NUMFIN=NUMSTR+NUMCHR(N)-1
         FINCOL(N)=NUMFIN
         CALL NAW_DFT (
     I                 NUMCHR(N),
     I                 IDEFLT,DEFALT,
     B                 BUFBIO (NUMSTR:NUMFIN)
     &                )
  100 CONTINUE
C
C2----Write Nawdex location information
C
      WRITE(IOUT,'(I5,26(''!'',A),''!9999!'')')
     &           NAWSEQ,
     &           (BUFBIO (STRCOL(N):FINCOL(N)), N=1,26)
C*********************************************************************C
C<><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><C
C                  Return to Calling Program
C<><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><C
C*********************************************************************C
 1000 RETURN
      END
      SUBROUTINE NAW_PHY  (
     I                    IOUT,
     I                    IDEFLT,DEFALT,
     I                    BUFPHY,
     I                    NAWSEQ
     &                   )
C-----------------------------------------------------------------------
C
C---VERSION 2.0 NAW_PHY  01JANUARY1991
C
C:::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::
C
C .. Purpose:
```

```
C
C     Reads the Nadex tape file and generates the following file:
C      surface_water file.
C
C:::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::
C
C .. Language: FORTRAN, with ARC/INFO subroutine call version 5.0
C
C
C    Inputs:
C
C     BUFPHY   : CHARACTER BUFFER CONTAINING NAWDEX DATA
C     DEFALT   : DEFAULT CHARACTER (CURRENTLY SET TO 9)
C     IDEFLT   : DEFAULT LENGTH
C     IOUT     : FORTRAN UNIT NUMBER FOR NAWDEX PHY_DATA FILE
C     NAWSEQ   : NAWDEX SEQUENCE NUMBER
C
C    Outputs:
C
C .. History:
C
C      Leonard L. Orzol      01/22/91      Original Coding.
C                                          USGS WRD Portland, Or
C                                          Fts: 429-2256
C      Leonard L. Orzol      01/22/91      Coding for Sun 4110.
C
C-------------------------------------------------------------------------
C
C        SPECIFICATIONS:
C     ---------------------------------------------------------------
C
      PARAMETER (MAXITM=13)
C
      INTEGER IOUT,NAWSEQ,
     &        STRCOL(MAXITM),NUMCHR(MAXITM),FINCOL(MAXITM)
C
      CHARACTER*101 BUFPHY
      CHARACTER*1 DEFALT
C
      DATA (STRCOL(N), N=1,MAXITM) /1,2,3,4,5,6,7,8,9,13,17,21,22/
      DATA (NUMCHR(N), N=1,MAXITM) /8*1,3*4,1,80/
C
C     ---------------------------------------------------------------
C
C1----Loop to check Nawdex buffer for missing information
C
      DO 100 N=1,13
         NUMSTR=STRCOL(N)
         NUMFIN=NUMSTR+NUMCHR(N)-1
         FINCOL(N)=NUMFIN
         CALL NAW_DFT (
     I                 NUMCHR(N),
     I                 IDEFLT,DEFALT,
     B                 BUFPHY (NUMSTR:NUMFIN)
     &                )
  100 CONTINUE
C
C2----Write Nawdex location information
C
```

```
      WRITE(IOUT,'(I5,13(''!'',A),''!9999!'')')
     &            NAWSEQ,
     &            (BUFPHY (STRCOL(N):FINCOL(N)), N=1,13)
C*********************************************************************C
C<><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><>C
C                   Return to Calling Program
C<><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><>C
C*********************************************************************C
 1000 RETURN
      END
      SUBROUTINE NAW_SED  (
     I                    IOUT,
     I                    IDEFLT,DEFALT,
     I                    BUFSED,
     I                    NAWSEQ
     &                   )
C----------------------------------------------------------------------
C
C---VERSION 2.0 NAW_SED  01JANUARY1991
C
C::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::
C
C .. Purpose:
C
C     Reads the Nadex tape file and generates the following file:
C      sediment file (sed_data).
C
C::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::
C
C .. Language: FORTRAN, with ARC/INFO subroutine call version 5.0
C
C
C    Inputs:
C
C     BUFSED  : CHARACTER BUFFER CONTAINING NAWDEX DATA
C     DEFALT  : DEFAULT CHARACTER (CURRENTLY SET TO 9)
C     IDEFLT  : DEFAULT LENGTH
C     IOUT    : FORTRAN UNIT NUMBER FOR NAWDEX SED_DATA FILE
C     NAWSED  : NAWDEX SEDIMENT FILENAME
C     NAWSEQ  : NAWDEX SEQUENCE NUMBER
C
C    Outputs:
C
C .. History:
C
C      Leonard L. Orzol      01/22/91      Original Coding.
C                                          USGS WRD Portland, Or
C                                          Fts: 429-2256
C      Leonard L. Orzol      01/22/91      Coding for Sun 4110.
C
C------------------------------------------------------------------------
C
C        SPECIFICATIONS:
C     -----------------------------------------------------------------
C
      PARAMETER (MAXITM=13)
C
      INTEGER IOUT,
     &        STRCOL(MAXITM),NUMCHR(MAXITM),FINCOL(MAXITM)
```

```
C
      CHARACTER*101 BUFSED
      CHARACTER*1 DEFALT
C
      DATA (STRCOL(N), N=1,MAXITM) /1,2,3,4,5,6,7,8,9,13,17,21,22/
      DATA (NUMCHR(N), N=1,MAXITM) /8*1,3*4,1,80/
C
C     ------------------------------------------------------------------
C
C1----Loop to check Nawdex buffer for missing information
C
      DO 100 N=1,13
         NUMSTR=STRCOL(N)
         NUMFIN=NUMSTR+NUMCHR(N)-1
         FINCOL(N)=NUMFIN
         CALL NAW_DFT (
     I                  NUMCHR(N),
     I                  IDEFLT,DEFALT,
     B                  BUFSED (NUMSTR:NUMFIN)
     &                 )
  100 CONTINUE
C
C2----Write Nawdex location information
C
      WRITE(IOUT,'(I5,13(''!'',A),''!9999!'')')
     &           NAWSEQ,
     &           (BUFSED (STRCOL(N):FINCOL(N)), N=1,13)
C*********************************************************************C
C<><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><C
C                   Return to Calling Program
C<><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><C
C*********************************************************************C
 1000 RETURN
      END
      SUBROUTINE NAW_CHM  (
     I                    IOUT,
     I                    IDEFLT,DEFALT,
     I                    BUFCHM,
     I                    NAWSEQ
     &                   )
C---------------------------------------------------------------------
C
C---VERSION 2.0 NAW_CHM  01JANUARY1991
C
C:::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::
C
C .. Purpose:
C
C     Reads the Nadex tape file and generates the following file:
C      chemical file (chm_data).
C
C:::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::
C
C .. Language: FORTRAN, with ARC/INFO subroutine call version 5.0
C
C
C    Inputs:
C
C     BUFCHM  : CHARACTER BUFFER CONTAINING NAWDEX DATA
```

```
C     DEFALT  : DEFAULT CHARACTER (CURRENTLY SET TO 9)
C     IDEFLT  : DEFAULT LENGTH
C     IOUT    : FORTRAN UNIT NUMBER FOR NAWDEX CHM_DATA FILE
C     NAWSEQ  : NAWDEX SEQUENCE NUMBER
C
C    Outputs:
C
C .. History:
C
C      Leonard L. Orzol      01/22/91      Original Coding.
C                                          USGS WRD Portland, Or
C                                          Fts: 429-2256
C      Leonard L. Orzol      01/22/91      Coding for Sun 4110.
C
C-----------------------------------------------------------------------
C
C        SPECIFICATIONS:
C     ------------------------------------------------------------------
C
      PARAMETER (MAXITM=26)
C
      INTEGER IOUT,NAWSEQ,
     &        STRCOL(MAXITM),NUMCHR(MAXITM),FINCOL(MAXITM)
C
      CHARACTER*114 BUFCHM
      CHARACTER*1 DEFALT
C
      DATA (STRCOL(N), N=1,MAXITM)
     &             /1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,19,20,
     &             21,22,26,30,34,35/
      DATA (NUMCHR(N), N=1,MAXITM) /21*1,3*4,1,80/
C
C     ------------------------------------------------------------------
C
C1----Loop to check Nawdex buffer for missing information
C
      DO 100 N=1,26
         NUMSTR=STRCOL(N)
         NUMFIN=NUMSTR+NUMCHR(N)-1
         FINCOL(N)=NUMFIN
         CALL NAW_DFT (
     I                  NUMCHR(N),
     I                  IDEFLT,DEFALT,
     B                  BUFCHM (NUMSTR:NUMFIN)
     &                 )
  100 CONTINUE
C
C2----Write Nawdex location information
C
      WRITE(IOUT,'(I5,26(''!'',A),''!9999!'')')
     &           NAWSEQ,
     &           (BUFCHM (STRCOL(N):FINCOL(N)), N=1,26)
C*****************************************************************C
C<><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><C
C                  Return to Calling Program
C<><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><C
C*****************************************************************C
 1000 RETURN
      END
```

```
      SUBROUTINE NAW_MET  (
     I                     IOUT,
     I                     IDEFLT,DEFALT,
     I                     BUFMET,
     I                     NAWSEQ
     &                    )
C-----------------------------------------------------------------------
C
C---VERSION 2.0 NAW_MET  01JANUARY1991
C
C:::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::
C
C .. Purpose:
C
C     Reads the Nadex tape file and generates the following file:
C      meterological file.
C
C:::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::
C
C .. Language: FORTRAN, with ARC/INFO subroutine call version 5.0
C
C
C    Inputs:
C
C     BUFMET  : CHARACTER BUFFER CONTAINING NAWDEX DATA
C     DEFALT  : DEFAULT CHARACTER (CURRENTLY SET TO 9)
C     IDEFLT  : DEFAULT LENGTH
C     IOUT    : FORTRAN UNIT NUMBER FOR NAWDEX MET_DATA FILE
C     NAWSEQ  : NAWDEX SEQUENCE NUMBER
C
C    Outputs:
C
C .. History:
C
C      Leonard L. Orzol      01/22/91      Original Coding.
C                                          USGS WRD Portland, Or
C                                          Fts: 429-2256
C      Leonard L. Orzol      01/22/91      Coding for Sun 4110.
C
C-----------------------------------------------------------------------
C
C        SPECIFICATIONS:
C     ------------------------------------------------------------------
C
      PARAMETER (MAXITM=21)
C
      INTEGER IOUT,NAWSEQ,
     &        STRCOL(MAXITM),NUMCHR(MAXITM),FINCOL(MAXITM)
C
      CHARACTER*38 BUFMET
      CHARACTER*1 DEFALT
C
      DATA (STRCOL(N), N=1,MAXITM)
     &             /1,5,9,10,11,12,13,14,15,16,17,18,30,31,35,36,37,38,
     &             39,49,56/
      DATA (NUMCHR(N), N=1,MAXITM) /4,4,9*1,12,1,4,4*1,10,7,1/
C
C     ------------------------------------------------------------------
C
```

```
C1----Loop to check Nawdex buffer for missing information
C
      DO 100 N=1,18
         NUMSTR=STRCOL(N)
         NUMFIN=NUMSTR+NUMCHR(N)-1
         FINCOL(N)=NUMFIN
         CALL NAW_DFT (
     I                  NUMCHR(N),
     I                  IDEFLT,DEFALT,
     B                  BUFMET (NUMSTR:NUMFIN)
     &                 )
  100 CONTINUE
C
C2----Write Nawdex location information
C
      WRITE(IOUT,'(I5,18(''!'',A),''!9999!'')')
     &           NAWSEQ,
     &           (BUFMET (STRCOL(N):FINCOL(N)), N=1,18)
C*****************************************************************C
C<><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><C
C                   Return to Calling Program
C<><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><C
C*****************************************************************C
 1000 RETURN
      END
      SUBROUTINE NAW_KEY (
     I                    IOUT,
     I                    NAWSEQ,
     I                    NAWACT,
     I                    NAWKEY,
     I                    NFLAGS
     &                   )
C-----------------------------------------------------------------
C
C---VERSION 2.0 NAW_KEY 01JANUARY1991
C
C:::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::
C
C .. Purpose:
C
C     Reads the Nadex active_flags for each station then records with
C      active_flag equal Y with enter into appropiate data file.
C
C:::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::
C
C .. Language: FORTRAN, with ARC/INFO subroutine call version 5.0
C
C
C    Inputs:
C
C     IOUT    : FORTRAN UNIT NUMBER FOR NAWDEX KEY_DATA ASCII FILE
C     NAWSEQ  : NAWDEX SEQUENCE NUMBER
C     NAWACT  : CHARACTER*1 ARRAY FOR NAWDEX ACTIVE_FLAGS
C     NAWKEY  : INTEGER ARRAY FOR NAWDEX KEY_FLAGS
C     NFLAGS  : NUMBER OF NAWDEX ACTIVE_FLAGS
C
C    Outputs:
C
C .. History:
```

```
C
C      Leonard L. Orzol      01/22/91      Original Coding.
C                                          USGS WRD Portland, Or
C                                          Fts: 429-2256
C      Leonard L. Orzol      01/22/91      Coding for Sun 4110.
C
C-------------------------------------------------------------------------
C
C        SPECIFICATIONS:
C     ------------------------------------------------------------------
C
      CHARACTER*1 NAWACT(NFLAGS)
      INTEGER IOUT,
     &        NAWKEY(NFLAGS)
C
C     ------------------------------------------------------------------
C
C1----Write Nawdex key_flag and active_flag information
C
      WRITE(IOUT,'(I5,''!'',8(A1,''!'',I10,''!''),''-9999!'')')
     &           NAWSEQ,
     &           (NAWACT(N),NAWKEY(N), N=4,NFLAGS)
C*************************************************************************C
C<><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><C
C                  Return to Calling Program
C<><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><C
C*************************************************************************C
 1000 RETURN
      END
      SUBROUTINE NAW_OUT (
     I                    IOUT,
     I                    NAWSEQ,
     I                    NAWID,
     I                    NAWFLG,
     I                    NFLAGS
     &                   )
C-------------------------------------------------------------------------
C
C---VERSION 2.00 NAW_OUT 01JANUARY1991
C
C:::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::
C
C .. Purpose:
C
C     Writes operation information to nawdex.out file during the
C      Nawdex_arc program.
C
C:::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::
C
C .. Language: FORTRAN, with ARC/INFO subroutine call version 5.0
C
C
C    Inputs:
C
C     IOUT    : UNIT NUMBER FOR NAWDEX REPORTING FILE
C     NAWID   : NAWDEX STATION-ID
C     NAWSEQ  : NAWDEX SEQUENT NUMBER (COVERAGE NAWDEX#)
C     NAWFLG  : INTEGER ARRAY CONTAINING ACTIVE FLAGS
C             => 1 READ OUTPUT SUCCESSFULLY
```

```
C              => 0 UNSUCCESSFUL
C     NFLAGS  : NUMBER OF ACTIVE_FLAGS
C
C    Outputs: None
C
C     Program:
C
C .. History:
C
C      Leonard L. Orzol      01/22/91      Original Coding.
C                                          USGS WRD Portland, Or
C                                          Fts: 429-2256
C      Leonard L. Orzol      01/22/91      Coding for Sun 4110.
C
C-------------------------------------------------------------------------
C
C        SPECIFICATIONS:
C     -------------------------------------------------------------------
C
      INTEGER IOUT
C
      CHARACTER*22 NAWID
C
      INTEGER NAWFLG(NFLAGS),NAWSEQ
C
C     -------------------------------------------------------------------
C
C1----Write output flags to operations file nawdex.out
C
      WRITE(IOUT,101) NAWSEQ,NAWID,(NAWFLG(N), N=1,NFLAGS)
  101  FORMAT(10X,I10,10X,A22,3X,'|',15(I1,'|'))
C*********************************************************************C
C<><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><>C
C                  Return to Calling Program
C<><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><>C
C*********************************************************************C
 1000 RETURN
      END
      SUBROUTINE NAW_DFT  (
     I                    NUMCHR,
     I                    IDEFLT,DEFALT,
     B                    NAWVAR
     E                    )
C----------------------------------------------------------------------
C
C---VERSION 2.0 NAW_DFT  24JANUARY1991
C
C:::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::
C
C .. Purpose:
C
C     Reads a Nadex variable for nulls and replaces with default
C      character.
C
C:::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::
C
C .. Language: FORTRAN, with ARC/INFO subroutine call version 5.0
C
C
```

```
C    Inputs:
C
C     NUMCHR  : NUMBER OF CHARACTERS IN BUFFER CONTAINING NAWDEX DATA
C     DEFALT  : DEFAULT CHARACTER (CURRENTLY SET TO 9)
C     IDEFLT  : DEFAULT LENGTH
C
C    Outputs:
C
C     NAWVAR  : NAWDEX CHARACTER BUFFER
C
C .. History:
C
C      Leonard L. Orzol      01/22/91      Original Coding.
C                                          USGS WRD Portland, Or
C                                          Fts: 429-2256
C      Leonard L. Orzol      01/22/91      Coding for Sun 4110.
C
C-----------------------------------------------------------------------
C
C        SPECIFICATIONS:
C     ------------------------------------------------------------------
C
      CHARACTER*1 NAWVAR(NUMCHR)
      CHARACTER*1 DEFALT
C
      INTEGER DATFLG,NLLFLG,SPCFLG
C
C     ------------------------------------------------------------------
C
C1----Set character flags
C
      NLLFLG=0
      SPCFLG=0
      DATFLG=0
C
C2----Loop to check Nawdex variable
C
      DO 200 N=1,NUMCHR
         INAWVAR=ICHAR(NAWVAR(N))
       IF(INAWVAR.LT.IDEFLT) THEN
          NAWVAR(N)='
          NLLFLG=1
       ELSE IF(INAWVAR.EQ.IDEFLT) THEN
          SPCFLG=1
       ELSE
          DATFLG=1
       ENDIF
  200 CONTINUE
C
C3----Loop to fill Nawdex variable field correctly with defaults
C
      IF(DATFLG.GT.0) THEN
         RETURN
      ELSE
         DO 300 N=1,NUMCHR
            NAWVAR(N)=DEFALT
  300    CONTINUE
      ENDIF
C*******************************************************************C
```

```
C<><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><>C
C                  Return to Calling Program
C<><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><>C
C**********************************************************************C
 1000 RETURN
      END
C<><><><><><><><><><><> FILE UTILITY SUBROUTINES <><><><><><><><><><><>C
C
C---VERSION 2.0
C
C::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::
C
C .. Purpose:
C
C     A set of subroutines that deal files input.
C
C    Subroutines:
C
C     OPEN_FILE     : Opens files or checks file status for either direct
C                       or sequential access, formatted or unformatted,
C                       and old or new.
C     CLOSE_FILE    : Closes files.
C     DELETE_FILE   : Closes and deletes files.
C
C    Secondary Subroutines:
C
C     NONE          :
C::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::
C
C .. Language: FORTRAN, with ARC/INFO subroutine call version 5.01
C
C .. History:
C
C      Leonard L. Orzol      1989-90       Original Coding.
C                                          USGS WRD Portland, Or
C                                          Fts: 429-2256
C
C-------------------------------------------------------------------------
C**********************************************************************C
C<><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><>C
      SUBROUTINE OPEN_FILE (IU,FNAME,NSTAT,ITALK,*)
C-----------------------------------------------------------------------
C
C---VERSION 2.0 18DECEMBER1990
C
C::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::
C
C .. Purpose:
C
C  This routine either opens, creates, or inquires files.  The user can
C   specified the function of open_file as described below.
C
C
C::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::
C
C .. Language: Fortran77
C
C
C    Inputs:
```

```
C
C  IU    = FORTRAN UNIT NUMBER OF FILE
C          < 0 => UNFORMATTED FILE
C            0 => RETURN FORMAT STATUS (WHEN NSTAT=0 ONLY)
C          > 0 => FORMATTED FILE
C  FNAME = FILE NAME
C  NSTAT = STATUS OF FILE
C          DIRECT ACCESS ONLY
C           -4 => UNDETERMINED STATUS (MAY OR MAY NOT EXIST)
C                 IF IT DOES NOT EXIST, IT IS CREATED BY OPEN STATEMENT
C                 IF IT DOES EXIST, IT IS OPENED AS 'OLD' FILE
C           -3 => SCRATCH FILE (DELETED AUTOMATICALLY WHEN RUN ENDS)
C           -2 => NEW FILE
C           -1 => OLD FILE
C          FILE STATUS
C            0 => RETURN FILE STATUS FOR OPEN, FORMAT, FILE ACCESS
C          SEQUENTIAL ACCESS ONLY
C            1 => OLD FILE
C            2 => NEW FILE
C            3 => SCRATCH FILE (DELETED AUTOMATICALLY WHEN RUN ENDS)
C            4 => UNDETERMINED STATUS (MAY OR MAY NOT EXIST)
C                  IF IT DOES NOT EXIST, IT IS CREATED BY OPEN STATEMENT
C                  IF IT DOES EXIST, IT IS OPENED AS 'OLD' FILE
C
C  ITALK = FLAG INDICATING IF THERE IS INTERACTIVE DIALOGUE AT
C           TERMINAL
C
C           0 => THERE IS INTERACTIVE DIALOGUE
C           1 => THERE IS NOT INTERACTIVE DIALOGUE (BATCH MODE)
C
C    Outputs: WHEN INPUT
C                     NSTAT => 0
C                     IU    => 0
C
C  IU    = FORMAT STATUS
C          99 => FORMATTED FILE
C           0 => UNDETERMINED STATUS
C         -99 => UNFORMATTED FILE
C        -999 => FILES DOES NOT EXIST
C  NSTAT = ACCESS STATUS OF FILE
C          99 => SEQUENTIAL ACCESS
C           0 => UNDETERMINED STATUS
C         -99 => DIRECT ACCESS
C        -999 => FILE DOES NOT EXIST
C  ITALK = OPEN STATUS OF FILE
C           99 => FILE IS OPEN
C          -99 => FILE IS CLOSED
C         -999 => FILE DOES NOT EXIST
C
C .. History:
C
C      Dave Pollack?        ??/??/??      Original Concept.
C                U.S. Geological Survey, Reston, Virginia
C
C      Leonard L. Orzol      03/13/90     Original Coding.
C                            12/18/90     Modified for Prime,Suns or DisII
C                U.S. Geological Survey, Portland, Oregon  Fts: 429-2256
C
C-----------------------------------------------------------------------
```

```
C
      CHARACTER*(*) FNAME
      CHARACTER*80 ACCSS,DRECT,FMT,SEQUENT,UNFMT
      INTEGER NSTAT,IU,ITALK,IERR
      LOGICAL*4 EXISTS,OPN
C*************************************************************************C
C
C----Inquire on file
C
    2 INQUIRE (
     F          FILE=FNAME,
     I          IOSTAT=IERR,
     L          ERR=7777,
     E          EXIST=EXISTS,
     S          OPENED=OPN,
     T          ACCESS=ACCSS,
     A          SEQUENTIAL=SEQUENT,
     T          DIRECT=DRECT,
     U          FORMATTED=FMT,
     S          UNFORMATTED=UNFMT
     &          )
C
C0-----Return file parameters
C
      IF(NSTAT.EQ.0) THEN
C
C0A-----File existence status
C
       IF(EXISTS) THEN
          NSTAT=0
          IU=0
          ITALK=0
       ELSE
          NSTAT=-999
          IU=-999
          ITALK=-999
          RETURN
       ENDIF
C
C0B-----File open status
C
       IF(OPN) THEN
          ITALK=99
       ELSE
          ITALK=-99
       ENDIF
C
C0C-----File access status
C
       IF(SEQUENT.EQ.'YES') THEN
          NSTAT=99
       ELSE IF(SEQUENT.EQ.'NO') THEN
        IF(DRECT.EQ.'YES')  THEN
           NSTAT=-99
        ELSE
           NSTAT=0
        ENDIF
       ELSE
        IF(DRECT.EQ.'YES')  THEN
```

```
            NSTAT=-99
          ELSE
            NSTAT=0
          ENDIF
        ENDIF
C
C0C-----File record format status
C
        IF(FMT.EQ.'YES') THEN
           IU=99
        ELSE IF(FMT.EQ.'NO') THEN
          IF(UNFMT.EQ.'YES') THEN
            IU=-99
          ELSE
            IU=0
          ENDIF
        ELSE
          IF(UNFMT.EQ.'YES') THEN
            IU=-99
          ELSE
            IU=0
          ENDIF
        ENDIF
C
C0D-----Return file parameters
C
          RETURN
C
C1---OPEN AN EXISTING FILE
C
      ELSE IF(NSTAT.EQ.1 .OR. NSTAT.EQ.-1) THEN
C
C1A-----File open status
C
        IF(OPN) THEN
           GO TO 6666
C
C1B-----File exist status
C
        ELSE
          IF(.NOT.EXISTS) THEN
            IF(ITALK.GT.0) THEN
  104         PRINT *,'Does Not Exists ',FNAME (1:INDEX(FNAME,' ')-1)
              PRINT *,'Enter The Name Of An Existing File (<Cr>=Quit):'
              READ (*,'(A)',ERR=104) FNAME
             IF(FNAME.EQ.' ') GO TO 9999
              GO TO 2
            ELSE
              PRINT *,'Does Not Exists ',FNAME (1:INDEX(FNAME,' ')-1)
              GO TO 9999
            ENDIF
          ENDIF
        ENDIF
C
C1C-----File access status
C
C
C1CA-----Sequential access
C
```

```
        IF(SEQUENT.EQ.'YES') THEN
           ACCSS='SEQUENTIAL'
         IF(NSTAT.LT.0) THEN
            PRINT *,'File is direct access not sequential'
            NSTAT=-99
            GO TO 9999
         ENDIF
C
C1CB-----Direct access
C
        ELSE
         IF(DRECT.EQ.'YES') THEN
            ACCSS='DIRECT'
          IF(NSTAT.GT.0) THEN
             PRINT *,'File is sequential access not direct'
             NSTAT=99
             GO TO 9999
          ENDIF
         ENDIF
        ENDIF
C
C1D-----File format status
C
        IF(IU.LT.0) THEN
          IF(FMT.EQ.'YES') THEN
             PRINT *,'File is formatted not unformatted'
             IU=99
             GO TO 9999
          ENDIF
           FMT='UNFORMATTED'
           IU=-IU
        ELSE
          IF(UNFMT.EQ.'YES') THEN
             PRINT *,'File is unformatted not formatted'
             IU=-99
             GO TO 9999
          ENDIF
           FMT='FORMATTED'
        ENDIF
C
C1E-----Open file
C
           OPEN (
     F           IU,
     I           FILE=FNAME,
     L           STATUS='OLD',
     E           ACCESS=ACCSS,
     O           FORM=FMT,
     P           IOSTAT=IERR,
     E           ERR=8888
     N          )
           RETURN
C
C2-----Open An New File
C
      ELSE IF(NSTAT.EQ.2 .OR. NSTAT.EQ.-2) THEN
C
C2A-----File exists already
C
```

```
       IF(EXISTS) THEN
        IF(ITALK.GT.0) THEN
  202      PRINT *,'Already Exists ',FNAME (1:INDEX(FNAME,' ')-1)
           PRINT *,'Enter The Name Of An New File (<Cr>=Quit):'
           READ (*,'(A)',ERR=202) FNAME
         IF(FNAME.EQ.' ') GO TO 9999
           GO TO 2
        ELSE
           PRINT *,'Already Exists ',FNAME (1:INDEX(FNAME,' ')-1)
           GO TO 9999
        ENDIF
C
C2B-----File access status
C
       ELSE
C
C2BA-----Sequential access
C
        IF(NSTAT.GT.0) THEN
           ACCSS='SEQUENTIAL'
C
C2BB-----Direct access
C
        ELSE
           ACCSS='DIRECT'
        ENDIF
C
C2C-----File format status
C
        IF(IU.LT.0) THEN
           FMT='UNFORMATTED'
           IU=-IU
        ELSE
           FMT='FORMATTED'
        ENDIF
       ENDIF
C
C2D-----Open file
C
          OPEN (
     F           IU,
     I           FILE=FNAME,
     L           STATUS='NEW',
     E           ACCESS=ACCSS,
     O           FORM=FMT,
     P           IOSTAT=IERR,
     E           ERR=8888
     N          )
         RETURN
C
C3-----Open An Scratch File
C
      ELSE IF(NSTAT.EQ.3 .OR. NSTAT.EQ.-3) THEN
C
C3A-----File exists already
C
       IF(EXISTS) THEN
        IF(ITALK.GT.0) THEN
  302      PRINT *,'Already Exists ',FNAME (1:INDEX(FNAME,' ')-1)
```

```
            PRINT *,'Enter The Name Of An Scratch File (<Cr>=Quit):'
            READ (*,'(A)',ERR=302) FNAME
         IF(FNAME.EQ.' ') GO TO 9999
            GO TO 2
         ENDIF
C
C3B-----File access status
C
        ELSE
C
C3BA-----Sequential access
C
         IF(NSTAT.GT.0) THEN
            ACCSS='SEQUENTIAL'
C
C3BB-----Direct access
C
         ELSE
            ACCSS='DIRECT'
         ENDIF
C
C3C-----File format status
C
         IF(IU.LT.0) THEN
            FMT='UNFORMATTED'
            IU=-IU
         ELSE
            FMT='FORMATTED'
         ENDIF
        ENDIF
C
C3D-----Open file
C
           OPEN (
     F           IU,
     I           FILE=FNAME,
     L           STATUS='SCRATCH',
     E           ACCESS=ACCSS,
     O           FORM=FMT,
     P           IOSTAT=IERR,
     E           ERR=8888
     N          )
         RETURN
C
C4-----Open An Unknown Status File
C
      ELSE IF(NSTAT.EQ.4 .OR. NSTAT.EQ.-4) THEN
C
C4A-----File exists
C
       IF(EXISTS) THEN
C
C4AA-----Already open
C
         IF(OPN) THEN
            ITALK=99
C
C4AAA-----File sequential access
C
```

```
          IF(NSTAT.GT.0) THEN
             NSTAT=99
           IF(ACCSS.EQ.'DIRECT') THEN
              PRINT *,'File is direct access not sequential'
              NSTAT=-99
           ENDIF
C
C4AAB-----File direct access
C
          ELSE
             NSTAT=-99
           IF(ACCSS.EQ.'SEQUENTIAL') THEN
              NSTAT=99
              PRINT *,'File is sequential access not direct'
           ENDIF
          ENDIF
C
C4AAC-----File format status
C
          IF(IU.LT.0) THEN
             IU=-99
            IF(FMT.EQ.'YES') THEN
               PRINT *,'File is formatted not unformatted'
               IU=99
            ENDIF
          ELSE
             IU=99
            IF(FMT.EQ.'UNFORMATTED') THEN
               PRINT *,'File is unformatted not formatted'
               IU=-99
            ENDIF
          ENDIF
            GO TO 6666
C
C4AB-----Unopen
C
        ELSE
C
C4ABA-----File sequential access
C
          IF(NSTAT.GT.0) THEN
           IF(ACCSS.EQ.'DIRECT') THEN
              PRINT *,'File is direct access not sequential'
              GO TO 9999
           ENDIF
C
C4ABB-----Direct access
C
          ELSE
           IF(ACCSS.EQ.'SEQUENTIAL') THEN
              PRINT *,'File is sequential access not direct'
              GO TO 9999
           ENDIF
          ENDIF
C
C4ABC-----File format status
C
          IF(IU.LT.0) THEN
           IF(FMT.EQ.'FORMATTED') THEN
```

```
            PRINT *,'File is formatted not unformatted'
            GO TO 9999
          ENDIF
           IU=-IU
         ELSE
          IF(FMT.EQ.'UNFORMATTED') THEN
            PRINT *,'File is unformatted not formatted'
            GO TO 9999
          ENDIF
         ENDIF
C
C4ABD-----Open file
C
          OPEN (IU,FILE=FNAME,STATUS='OLD',
     &          ACCESS=ACCSS,FORM=FMT,IOSTAT=IERR,ERR=8888)
          RETURN
        ENDIF
C
C4B-----File exist statuss
C
       ELSE
          GO TO 2
       ENDIF
C
C
C5-----Unknow Option
C
      ELSE
         PRINT *,'Poor choice for Type of File'
         GO TO 9999
      END IF
C*********************************************************************C
C                        Report errors
C*********************************************************************C
 6666 PRINT *,' ********************__ERROR__************************'
      PRINT *,' Already open for file ',
     &                  FNAME (1:INDEX(FNAME,' ')-1),' for Unit',IU
      PRINT *,' IOSTAT=',IERR
      PRINT *,'Abnormal Termination of Open_File_Subroutine'
      RETURN 1
C
 7777 PRINT *,' ********************__ERROR__************************'
      PRINT *,' Can not inquire on file ',
     &                  FNAME (1:INDEX(FNAME,' ')-1),' for Unit',IU
      PRINT *,' IOSTAT=',IERR
      PRINT *,'Abnormal Termination of Open_File_Subroutine'
      RETURN 1
C
 8888 PRINT *,' ********************__ERROR__************************'
      PRINT *,' Can not open file ',
     &                  FNAME (1:INDEX(FNAME,' ')-1),' on Unit',IU
      PRINT *,' IOSTAT=',IERR
      PRINT *,'Abnormal Termination of Open_File_Subroutine'
      RETURN 1
C
 9999 PRINT *,'Abnormal Termination of Open_File_Subroutine'
      RETURN 1
C*********************************************************************C
 1000 RETURN
```

```
      END
C_____________________________________________________________________C
      SUBROUTINE DELETE_FILE (FNAME,*)
C---------------------------------------------------------------------
C
C---VERSION 2.0 29MARCH1990
C
C:::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::
C
C .. Purpose:
C
C  THIS ROUTINE DELETES A SINGLE FILE.
C
C
C:::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::
C
C .. Language: Fortran77
C
C
C    Inputs:
C
C  FNAME = File Name
C
C .. History:
C
C      Leonard L. Orzol      03/13/90      Original Coding
C               USGS WRD Portland, Or Fts: 429-2256
C      Leonard L. Orzol      03/29/90      Improved Coding
C
C---------------------------------------------------------------------
C
      CHARACTER*(*) FNAME
      INTEGER IERR
      INTEGER IU
      LOGICAL*4 EXISTS,OPN
C*********************************************************************C
C
C1-----Inquire About Existing File
C
      INQUIRE (FILE=FNAME,IOSTAT=IERR,ERR=7777,
     &                              EXIST=EXISTS,OPENED=OPN,NUMBER=IU)
C
C1-----Existence of File
C
      IF(.NOT.EXISTS) THEN
         PRINT *,FNAME (1:INDEX(FNAME,' ')-1),' File exist status'
         RETURN
      ELSE
       IF(OPN) THEN
          CLOSE (IU,STATUS='DELETE',ERR=8888,IOSTAT=IERR)
       ELSE
          IU=10
  2       INQUIRE (UNIT=IU,IOSTAT=IERR,ERR=7777,
     &                              EXIST=EXISTS,OPENED=OPN)
        IF(OPN) THEN
           IU=IU+1
           GO TO 2
        ENDIF
          OPEN (IU,FILE=FNAME,ERR=9999,IOSTAT=IERR)
```

```
         CLOSE (IU,STATUS='DELETE',ERR=8888,IOSTAT=IERR)
       ENDIF
         RETURN
      ENDIF
C*******************************************************************C
C                       Report errors
C*******************************************************************C
 7777 PRINT *,' ********************__ERROR__************************'
      PRINT *,' Can not inquire on file ',
     &                 FNAME (1:INDEX(FNAME,' ')-1),' for Unit',IU
      PRINT *,' IOSTAT=',IERR
      PRINT *,'Abnormal Termination of Delete_File_Subroutine'
      RETURN 1
C
 8888 PRINT *,' ********************__ERROR__************************'
      PRINT *,' Can not close file ',
     &                 FNAME (1:INDEX(FNAME,' ')-1),' on Unit',IU
      PRINT *,' IOSTAT=',IERR
      PRINT *,'Abnormal Termination of Delete_File_Subroutine'
      RETURN 1
C
 9999 PRINT *,' ********************__ERROR__************************'
      PRINT *,' Can not open file ',
     &                 FNAME (1:INDEX(FNAME,' ')-1),' on Unit',IU
      PRINT *,' IOSTAT=',IERR
      PRINT *,'Abnormal Termination of Delete_File_Subroutine'
      RETURN 1
C*******************************************************************C
 1000 RETURN
      END
C_____________________________________________________________________C
      SUBROUTINE CLOSE_FILE (FNAME,*)
C---------------------------------------------------------------------
C
C---VERSION 2.0 12MARCH1990
C
C:::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::
C
C .. Purpose:
C
C  THIS ROUTINE CLOSES A SINGLE FILE.
C
C
C:::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::
C
C .. Language: Fortran77
C
C
C    Inputs:
C
C  FNAME = FILE NAME
C
C .. History:
C
C      Leonard L. Orzol      03/13/90      Original Coding
C               USGS WRD Portland, Or Fts: 429-2256
C
C---------------------------------------------------------------------
C
```

```
      CHARACTER*80 FNAME
      INTEGER IERR
      LOGICAL EXISTS,OPN
C*********************************************************************C
C
C1-----Inquire About Existing File
C
      INQUIRE (FILE=FNAME,IOSTAT=IERR,ERR=9999,
     &                              EXIST=EXISTS,OPENED=OPN,NUMBER=IU)
C
C1-----Existence of File
C
      IF(.NOT.EXISTS) THEN
         PRINT *,'System File ',FNAME (1:INDEX(FNAME,' ')-1),' does not e
     &xist'
         RETURN
       ELSE
        IF(OPN) THEN
           CLOSE (IU,STATUS='KEEP',ERR=8888,IOSTAT=IERR)
        ENDIF
         RETURN
       ENDIF
C*********************************************************************C
C                       Report errors
C*********************************************************************C
 8888 PRINT *,' *****ERROR*****'
      PRINT *,' Can not close file ',
     &                  FNAME (1:INDEX(FNAME,' ')-1),' Unit',IU
      PRINT *,' IOSTAT=',IERR
      PRINT *,'Abnormal Termination of Close_File_Subroutine'
      RETURN 1
C
 9999 PRINT *,' *****ERROR*****'
      PRINT *,' Can not inquire on file ',
     &                  FNAME (1:INDEX(FNAME,' ')-1),' Unit',IU
      PRINT *,' IOSTAT=',IERR
      PRINT *,'Abnormal Termination of Close_File_Subroutine'
      RETURN 1
C*********************************************************************C
 1000 RETURN
      END
```

```
      PROGRAM NAWDEX_COORD
C************* U.S. Geological Survey preliminary computer program ************
C*******************************************************************************
C************             Nawdex_Coord version 2.0                  ************
C*******************************************************************************
C**          Language: Fortran 77                                              **
C**          Program must be recompiled then bind with system libraries        **
C**             Primos
C**             Sun3, Sun4
C**             DG computers
C**           The source code is available from below:
C*:::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::
C*==============================================================================
C*     Author/Site,      Date,        Event
C*   ----------------------------------------------------------------------------
C*   Leonard L. Orzol    01/22/91   USGS-WRD Portland OR  Original Coding
C*
C*==============================================================================
C*::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::
C*
C* Disclaimer:
C*
C*       Although this program has been used by the U.S. Geological Survey,
C*       no warranty, expressed or implied, is made by the USGS as to the
C*       accuracy and functioning of the program and related program
C*       material nor shall the fact of distribution constitute any such
C*       warranty, and no responsibility is assumed by the USGS in
C*       connection therewith.
C*
C*::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::
C-------------------------------------------------------------------------
C
C---VERSION 1.0 NAWDEX_COORD 01JANUARY1991
C
C:::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::
C
C .. Purpose:
C
C     Reads the Nadex projected coordinates file and output these
C      coordinates with a coverage-id (nawdex-id) so the output file
C      can be used with the GENERATE command.
C
C:::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::
C
C .. Language: FORTRAN, with ARC/INFO subroutine call version 5.01
C
C
C    Inputs:
C
C      Files:
C
C     NAWPRJ   : PROJECTED NAWDEX COORDINATE FILE
C     NAWCRD   : GENERATE INPUT NAWDEX COORDINATE FILE
C
C    Outputs:
C
C     Program:
C
C      Variables:
```

```
C
C     IOUT    : FORTRAN UNIT NUMBER FOR OUTPUT DATA FILE
C     ITALK   : FLAG FOR INTERACTIVE DIALOG
C             => 1 NON-INTERACTIVE DIALOG
C             => 0 INTERACTIVE DIALOG
C     MAXARC  : MAXIMUM DIMENSION OF THE NUMBER OF ARCS
C     NROW    : NUMBER OF ROWS IN GRID
C     NSTAT   : STATUS OF FILE
C             => 1 OLD FILE
C             => 2 NEW FILE
C             => 3 SCRATCH FILE (DELETED AUTOMATICALLY WHEN RUN ENDS)
C             => 4 UNDETERMINED STATUS (MAY OR MAY NOT EXIST)
C                  IF IT DOES NOT EXIST, IT IS CREATED BY OPEN STATEMENT
C                  IF IT DOES EXIST, IT IS OPENED AS 'OLD' FILE
C     NUNIT   : FORTRAN UNIT NUMBER
C
C .. History:
C
C      Leonard L. Orzol      01/22/91      Original Coding.
C                                          USGS WRD Portland, Or
C                                          Fts: 429-2256
C      Leonard L. Orzol      01/22/91      Coding for Sun 4110.
C
C
C-----------------------------------------------------------------------
C        SPECIFICATIONS:
C     ------------------------------------------------------------------
C
      PARAMETER (MAXCRD=5000, MAXFIL=3)
C
      CHARACTER*80 FILNAM(MAXFIL)
C
      INTEGER IUNIT(MAXFIL)
C
      COMMON /NAWCMN/ NAWX(MAXCRD),NAWY(MAXCRD),NAWID(MAXCRD)
C
      DATA (FILNAM(N), N=1,MAXFIL)
     &     /'nawprj','nawcrd','coord.errfil'/
      DATA (IUNIT(N), N=1,MAXFIL)
     &      /7,8,60/
C
C*********************************************************************C
C<><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><C
C                       Open projected coordinate file
C<><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><C
C1********************************************************************C
C
C1A-----Open projected coordinate file
C
      NSTAT=1
      ITALK=1
      CALL OPEN_FILE (IUNIT(1),FILNAM(1),NSTAT,ITALK,*9999)
C*********************************************************************C
C<><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><C
C                       Open coverage coordinate file
C<><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><C
C2********************************************************************C
C
C2A-----Open Nawdex coverage coordinate file
```

```
C
      NSTAT=2
      ITALK=1
      CALL DELETE_FILE (FILNAM(2),*9999)
      CALL OPEN_FILE (IUNIT(2),FILNAM(2),NSTAT,ITALK,*9999)
C
C2B-----Open Nawdex_Coord error file
C
      NSTAT=2
      ITALK=1
      IERROR=IUNIT(3)
      CALL DELETE_FILE (FILNAM(3),*9999)
      CALL OPEN_FILE (IERROR,FILNAM(3),NSTAT,ITALK,*9999)
C*********************************************************************C
C<><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><C
C              Read and write nawdex coordinate information
C<><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><C
C3********************************************************************C
      DO 300 NAWSEQ=1,50000
         READ(IUNIT(1),'(2G20.0)',ERR=9990,END=402) XCOORD,YCOORD
         WRITE(IUNIT(2),'(I10,2(1X,F15.5))') NAWSEQ,XCOORD,YCOORD
  300 CONTINUE
C*********************************************************************C
C<><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><C
C                  Close nawdex coordinate files
C<><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><C
C4********************************************************************C
  402   NAWSEQ=NAWSEQ-1
      IF(NAWSEQ.LE.0) GO TO 9991
         WRITE(IUNIT(2),*) 'END'
          CALL CLOSE_FILE (FILNAM(1),*9999)
           CALL CLOSE_FILE (FILNAM(2),*9999)
            CALL CLOSE_FILE (FILNAM(3),*9999)
             CALL DELETE_FILE (FILNAM(3),*9999)
              GO TO 1000
C*********************************************************************C
C                  ERRORS WITHIN NAWDEX_COORD PROGRAMS
CE********************************************************************C
 9990 WRITE(*,*)
     &       'Unable to read from ',FILNAM(1) (1:INDEX(FILNAM(1),' ')-1)
      WRITE(IERROR,*)
     &       'Unable to read from ',FILNAM(1) (1:INDEX(FILNAM(1),' ')-1)
      WRITE(*,*) 'Abnormal termination of Nawdex_Coord_Program'
      WRITE(IERR0R,*) 'Abnormal Termination of Nawdex_Coord_Program'
      CALL CLOSE_FILE (FILNAM(1),*9999)
      CALL CLOSE_FILE (FILNAM(2),*9999)
      CALL CLOSE_FILE (FILNAM(3),*9999)
      STOP
 9991 WRITE(*,*) 'End-of-file ',FILNAM(1) (1:INDEX(FILNAM(1),' ')-1)
      WRITE(IERROR,*)
     &      'End-of-file ',FILNAM(1) (1:INDEX(FILNAM(1),' ')-1)
      CALL CLOSE_FILE (FILNAM(1),*9999)
      CALL CLOSE_FILE (FILNAM(2),*9999)
      CALL CLOSE_FILE (FILNAM(3),*9999)
 9999 WRITE(*,*) 'Abnormal Termination of Nawdex_Coord_Program'
      WRITE(IERROR,*) 'Abnormal Termination of Nawdex_Coord_Program'
      STOP
C*********************************************************************C
C                  EXITING NAWDEX_COORD PROGRAM
```

```
C**********************************************************************C
C
 1000 STOP
      END
C<><><><><><><><><><><><><><> FILE UTILITY SUBROUTINES <><><><><><><><><><><><><><>C
C
C---VERSION 2.0
C
C::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::
C
C .. Purpose:
C
C     A set of subroutines that deal files input.
C
C    Subroutines:
C
C     OPEN_FILE     : Opens files or checks file status for either direct
C                       or sequential access, formatted or unformatted,
C                       and old or new.
C     CLOSE_FILE    : Closes files.
C     DELETE_FILE   : Closes and deletes files.
C
C    Secondary Subroutines:
C
C     NONE          :
C::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::
C
C .. Language: FORTRAN, with ARC/INFO subroutine call version 5.01
C
C .. History:
C
C      Leonard L. Orzol      1989-90       Original Coding.
C                                          USGS WRD Portland, Or
C                                          Fts: 429-2256
C
C--------------------------------------------------------------------------
C**********************************************************************C
C<><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><>C
      SUBROUTINE OPEN_FILE (IU,FNAME,NSTAT,ITALK,*)
C----------------------------------------------------------------------
C
C---VERSION 2.0 18DECEMBER1990
C
C::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::
C
C .. Purpose:
C
C  This routine either opens, creates, or inquires files.  The user can
C   specified the function of open_file as described below.
C
C
C::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::
C
C .. Language: Fortran77
C
C
C    Inputs:
C
C  IU    = FORTRAN UNIT NUMBER OF FILE
```

```
C          < 0 => UNFORMATTED FILE
C            0 => RETURN FORMAT STATUS (WHEN NSTAT=0 ONLY)
C          > 0 => FORMATTED FILE
C  FNAME = FILE NAME
C  NSTAT = STATUS OF FILE
C          DIRECT ACCESS ONLY
C           -4 => UNDETERMINED STATUS (MAY OR MAY NOT EXIST)
C                 IF IT DOES NOT EXIST, IT IS CREATED BY OPEN STATEMENT
C                 IF IT DOES EXIST, IT IS OPENED AS 'OLD' FILE
C           -3 => SCRATCH FILE (DELETED AUTOMATICALLY WHEN RUN ENDS)
C           -2 => NEW FILE
C           -1 => OLD FILE
C          FILE STATUS
C            0 => RETURN FILE STATUS FOR OPEN, FORMAT, FILE ACCESS
C          SEQUENTIAL ACCESS ONLY
C            1 => OLD FILE
C            2 => NEW FILE
C            3 => SCRATCH FILE (DELETED AUTOMATICALLY WHEN RUN ENDS)
C            4 => UNDETERMINED STATUS (MAY OR MAY NOT EXIST)
C                  IF IT DOES NOT EXIST, IT IS CREATED BY OPEN STATEMENT
C                  IF IT DOES EXIST, IT IS OPENED AS 'OLD' FILE
C
C  ITALK = FLAG INDICATING IF THERE IS INTERACTIVE DIALOGUE AT
C           TERMINAL
C
C           0 => THERE IS INTERACTIVE DIALOGUE
C           1 => THERE IS NOT INTERACTIVE DIALOGUE (BATCH MODE)
C
C    Outputs: WHEN INPUT
C                     NSTAT => 0
C                     IU    => 0
C
C  IU    = FORMAT STATUS
C          99 => FORMATTED FILE
C           0 => UNDETERMINED STATUS
C         -99 => UNFORMATTED FILE
C        -999 => FILES DOES NOT EXIST
C  NSTAT = ACCESS STATUS OF FILE
C          99 => SEQUENTIAL ACCESS
C           0 => UNDETERMINED STATUS
C         -99 => DIRECT ACCESS
C        -999 => FILE DOES NOT EXIST
C  ITALK = OPEN STATUS OF FILE
C          99 => FILE IS OPEN
C         -99 => FILE IS CLOSED
C        -999 => FILE DOES NOT EXIST
C
C .. History:
C
C      Dave Pollack?        ??/??/??      Original Concept.
C               U.S. Geological Survey, Reston, Virginia
C
C      Leonard L. Orzol      03/13/90     Original Coding.
C                            12/18/90     Modified for Prime,Suns or DisII
C               U.S. Geological Survey, Portland, Oregon  Fts: 429-2256
C
C-----------------------------------------------------------------------
C
      CHARACTER*(*) FNAME
```

```
      CHARACTER*80 ACCSS,DRECT,FMT,SEQUENT,UNFMT
      INTEGER NSTAT,IU,ITALK,IERR
      LOGICAL*4 EXISTS,OPN
C*************************************************************************C
C
C----Inquire on file
C
     2 INQUIRE (
      F          FILE=FNAME,
      I          IOSTAT=IERR,
      L          ERR=7777,
      E          EXIST=EXISTS,
      S          OPENED=OPN,
      T          ACCESS=ACCSS,
      A          SEQUENTIAL=SEQUENT,
      T          DIRECT=DRECT,
      U          FORMATTED=FMT,
      S          UNFORMATTED=UNFMT
      &          )
C
C0-----Return file parameters
C
      IF(NSTAT.EQ.0) THEN
C
C0A-----File existence status
C
       IF(EXISTS) THEN
          NSTAT=0
          IU=0
          ITALK=0
       ELSE
          NSTAT=-999
          IU=-999
          ITALK=-999
          RETURN
       ENDIF
C
C0B-----File open status
C
       IF(OPN) THEN
          ITALK=99
       ELSE
          ITALK=-99
       ENDIF
C
C0C-----File access status
C
       IF(SEQUENT.EQ.'YES') THEN
          NSTAT=99
       ELSE IF(SEQUENT.EQ.'NO') THEN
        IF(DRECT.EQ.'YES')  THEN
           NSTAT=-99
        ELSE
           NSTAT=0
        ENDIF
       ELSE
        IF(DRECT.EQ.'YES')  THEN
           NSTAT=-99
        ELSE
```

```
            NSTAT=0
          ENDIF
        ENDIF
C
C0C-----File record format status
C
        IF(FMT.EQ.'YES') THEN
           IU=99
        ELSE IF(FMT.EQ.'NO') THEN
          IF(UNFMT.EQ.'YES') THEN
            IU=-99
          ELSE
            IU=0
          ENDIF
        ELSE
          IF(UNFMT.EQ.'YES') THEN
            IU=-99
          ELSE
            IU=0
          ENDIF
        ENDIF
C
C0D-----Return file parameters
C
          RETURN
C
C1---OPEN AN EXISTING FILE
C
      ELSE IF(NSTAT.EQ.1 .OR. NSTAT.EQ.-1) THEN
C
C1A-----File open status
C
        IF(OPN) THEN
           GO TO 6666
C
C1B-----File exist status
C
        ELSE
          IF(.NOT.EXISTS) THEN
           IF(ITALK.GT.0) THEN
  104        PRINT *,'Does Not Exists ',FNAME (1:INDEX(FNAME,' ')-1)
             PRINT *,'Enter The Name Of An Existing File (<Cr>=Quit):'
             READ (*,'(A)',ERR=104) FNAME
            IF(FNAME.EQ.' ') GO TO 9999
              GO TO 2
            ELSE
              PRINT *,'Does Not Exists ',FNAME (1:INDEX(FNAME,' ')-1)
              GO TO 9999
            ENDIF
          ENDIF
        ENDIF
C
C1C-----File access status
C
C
C1CA-----Sequential access
C
        IF(SEQUENT.EQ.'YES') THEN
           ACCSS='SEQUENTIAL'
```

```
         IF(NSTAT.LT.0) THEN
            PRINT *,'File is direct access not sequential'
            NSTAT=-99
            GO TO 9999
         ENDIF
C
C1CB-----Direct access
C
        ELSE
         IF(DRECT.EQ.'YES') THEN
            ACCSS='DIRECT'
          IF(NSTAT.GT.0) THEN
             PRINT *,'File is sequential access not direct'
             NSTAT=99
             GO TO 9999
          ENDIF
         ENDIF
        ENDIF
C
C1D-----File format status
C
        IF(IU.LT.0) THEN
          IF(FMT.EQ.'YES') THEN
             PRINT *,'File is formatted not unformatted'
             IU=99
             GO TO 9999
          ENDIF
           FMT='UNFORMATTED'
           IU=-IU
        ELSE
          IF(UNFMT.EQ.'YES') THEN
             PRINT *,'File is unformatted not formatted'
             IU=-99
             GO TO 9999
          ENDIF
           FMT='FORMATTED'
        ENDIF
C
C1E-----Open file
C
           OPEN (
     F           IU,
     I           FILE=FNAME,
     L           STATUS='OLD',
     E           ACCESS=ACCSS,
     O           FORM=FMT,
     P           IOSTAT=IERR,
     E           ERR=8888
     N          )
           RETURN
C
C2-----Open An New File
C
      ELSE IF(NSTAT.EQ.2 .OR. NSTAT.EQ.-2) THEN
C
C2A-----File exists already
C
        IF(EXISTS) THEN
         IF(ITALK.GT.0) THEN
```

```
  202       PRINT *,'Already Exists ',FNAME (1:INDEX(FNAME,' ')-1)
            PRINT *,'Enter The Name Of An New File (<Cr>=Quit):'
            READ (*,'(A)',ERR=202) FNAME
          IF(FNAME.EQ.' ') GO TO 9999
            GO TO 2
          ELSE
            PRINT *,'Already Exists ',FNAME (1:INDEX(FNAME,' ')-1)
            GO TO 9999
          ENDIF
C
C2B-----File access status
C
        ELSE
C
C2BA-----Sequential access
C
          IF(NSTAT.GT.0) THEN
            ACCSS='SEQUENTIAL'
C
C2BB-----Direct access
C
          ELSE
            ACCSS='DIRECT'
          ENDIF
C
C2C-----File format status
C
          IF(IU.LT.0) THEN
            FMT='UNFORMATTED'
            IU=-IU
          ELSE
            FMT='FORMATTED'
          ENDIF
        ENDIF
C
C2D-----Open file
C
           OPEN (
     F           IU,
     I           FILE=FNAME,
     L           STATUS='NEW',
     E           ACCESS=ACCSS,
     O           FORM=FMT,
     P           IOSTAT=IERR,
     E           ERR=8888
     N          )
          RETURN
C
C3-----Open An Scratch File
C
       ELSE IF(NSTAT.EQ.3 .OR. NSTAT.EQ.-3) THEN
C
C3A-----File exists already
C
        IF(EXISTS) THEN
          IF(ITALK.GT.0) THEN
  302       PRINT *,'Already Exists ',FNAME (1:INDEX(FNAME,' ')-1)
            PRINT *,'Enter The Name Of An Scratch File (<Cr>=Quit):'
            READ (*,'(A)',ERR=302) FNAME
```

```
         IF(FNAME.EQ.' ') GO TO 9999
            GO TO 2
         ENDIF
C
C3B-----File access status
C
       ELSE
C
C3BA-----Sequential access
C
         IF(NSTAT.GT.0) THEN
            ACCSS='SEQUENTIAL'
C
C3BB-----Direct access
C
         ELSE
            ACCSS='DIRECT'
         ENDIF
C
C3C-----File format status
C
         IF(IU.LT.0) THEN
            FMT='UNFORMATTED'
            IU=-IU
         ELSE
            FMT='FORMATTED'
         ENDIF
       ENDIF
C
C3D-----Open file
C
           OPEN (
     F           IU,
     I           FILE=FNAME,
     L           STATUS='SCRATCH',
     E           ACCESS=ACCSS,
     O           FORM=FMT,
     P           IOSTAT=IERR,
     E           ERR=8888
     N          )
          RETURN
C
C4-----Open An Unknown Status File
C
      ELSE IF(NSTAT.EQ.4 .OR. NSTAT.EQ.-4) THEN
C
C4A-----File exists
C
       IF(EXISTS) THEN
C
C4AA-----Already open
C
         IF(OPN) THEN
            ITALK=99
C
C4AAA-----File sequential access
C
          IF(NSTAT.GT.0) THEN
             NSTAT=99
```

```
          IF(ACCSS.EQ.'DIRECT') THEN
             PRINT *,'File is direct access not sequential'
             NSTAT=-99
          ENDIF
C
C4AAB-----File direct access
C
         ELSE
            NSTAT=-99
          IF(ACCSS.EQ.'SEQUENTIAL') THEN
             NSTAT=99
             PRINT *,'File is sequential access not direct'
          ENDIF
         ENDIF
C
C4AAC-----File format status
C
         IF(IU.LT.0) THEN
            IU=-99
           IF(FMT.EQ.'YES') THEN
              PRINT *,'File is formatted not unformatted'
              IU=99
           ENDIF
         ELSE
            IU=99
           IF(FMT.EQ.'UNFORMATTED') THEN
              PRINT *,'File is unformatted not formatted'
              IU=-99
           ENDIF
         ENDIF
           GO TO 6666
C
C4AB-----Unopen
C
        ELSE
C
C4ABA-----File sequential access
C
         IF(NSTAT.GT.0) THEN
          IF(ACCSS.EQ.'DIRECT') THEN
             PRINT *,'File is direct access not sequential'
             GO TO 9999
          ENDIF
C
C4ABB-----Direct access
C
         ELSE
          IF(ACCSS.EQ.'SEQUENTIAL') THEN
             PRINT *,'File is sequential access not direct'
             GO TO 9999
          ENDIF
         ENDIF
C
C4ABC-----File format status
C
         IF(IU.LT.0) THEN
          IF(FMT.EQ.'FORMATTED') THEN
             PRINT *,'File is formatted not unformatted'
             GO TO 9999
```

```
          ENDIF
           IU=-IU
         ELSE
          IF(FMT.EQ.'UNFORMATTED') THEN
             PRINT *,'File is unformatted not formatted'
             GO TO 9999
          ENDIF
         ENDIF
C
C4ABD-----Open file
C
          OPEN (IU,FILE=FNAME,STATUS='OLD',
     &          ACCESS=ACCSS,FORM=FMT,IOSTAT=IERR,ERR=8888)
          RETURN
        ENDIF
C
C4B-----File exist statuss
C
       ELSE
          GO TO 2
       ENDIF
C
C
C5-----Unknow Option
C
      ELSE
         PRINT *,'Poor choice for Type of File'
         GO TO 9999
      END IF
C*********************************************************************C
C                        Report errors
C*********************************************************************C
 6666 PRINT *,' ********************__ERROR__************************'
      PRINT *,' Already open for file ',
     &                  FNAME (1:INDEX(FNAME,' ')-1),' for Unit',IU
      PRINT *,' IOSTAT=',IERR
      PRINT *,'Abnormal Termination of Open_File_Subroutine'
      RETURN 1
C
 7777 PRINT *,' ********************__ERROR__************************'
      PRINT *,' Can not inquire on file ',
     &                  FNAME (1:INDEX(FNAME,' ')-1),' for Unit',IU
      PRINT *,' IOSTAT=',IERR
      PRINT *,'Abnormal Termination of Open_File_Subroutine'
      RETURN 1
C
 8888 PRINT *,' ********************__ERROR__************************'
      PRINT *,' Can not open file ',
     &                  FNAME (1:INDEX(FNAME,' ')-1),' on Unit',IU
      PRINT *,' IOSTAT=',IERR
      PRINT *,'Abnormal Termination of Open_File_Subroutine'
      RETURN 1
C
 9999 PRINT *,'Abnormal Termination of Open_File_Subroutine'
      RETURN 1
C*********************************************************************C
 1000 RETURN
      END
C_____________________________________________________________________C
```

```
      SUBROUTINE DELETE_FILE (FNAME,*)
C-------------------------------------------------------------------------
C
C---VERSION 2.0 29MARCH1990
C
C:::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::
C
C .. Purpose:
C
C  THIS ROUTINE DELETES A SINGLE FILE.
C
C
C:::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::
C
C .. Language: Fortran77
C
C
C    Inputs:
C
C  FNAME = File Name
C
C .. History:
C
C      Leonard L. Orzol      03/13/90      Original Coding
C               USGS WRD Portland, Or Fts: 429-2256
C      Leonard L. Orzol      03/29/90      Improved Coding
C
C-------------------------------------------------------------------------
C
      CHARACTER*(*) FNAME
      INTEGER IERR
      INTEGER IU
      LOGICAL*4 EXISTS,OPN
C*************************************************************************C
C
C1-----Inquire About Existing File
C
      INQUIRE (FILE=FNAME,IOSTAT=IERR,ERR=7777,
     &                              EXIST=EXISTS,OPENED=OPN,NUMBER=IU)
C
C1-----Existence of File
C
      IF(.NOT.EXISTS) THEN
         PRINT *,FNAME (1:INDEX(FNAME,' ')-1),' File exist status'
         RETURN
      ELSE
       IF(OPN) THEN
          CLOSE (IU,STATUS='DELETE',ERR=8888,IOSTAT=IERR)
       ELSE
          IU=10
  2       INQUIRE (UNIT=IU,IOSTAT=IERR,ERR=7777,
     &                              EXIST=EXISTS,OPENED=OPN)
         IF(OPN) THEN
            IU=IU+1
            GO TO 2
         ENDIF
          OPEN (IU,FILE=FNAME,ERR=9999,IOSTAT=IERR)
          CLOSE (IU,STATUS='DELETE',ERR=8888,IOSTAT=IERR)
       ENDIF
```

```
          RETURN
        ENDIF
C*******************************************************************C
C                        Report errors
C*******************************************************************C
 7777 PRINT *,' ********************__ERROR__************************'
      PRINT *,' Can not inquire on file ',
     &                  FNAME (1:INDEX(FNAME,' ')-1),' for Unit',IU
      PRINT *,' IOSTAT=',IERR
      PRINT *,'Abnormal Termination of Delete_File_Subroutine'
      RETURN 1
C
 8888 PRINT *,' ********************__ERROR__************************'
      PRINT *,' Can not close file ',
     &                  FNAME (1:INDEX(FNAME,' ')-1),' on Unit',IU
      PRINT *,' IOSTAT=',IERR
      PRINT *,'Abnormal Termination of Delete_File_Subroutine'
      RETURN 1
C
 9999 PRINT *,' ********************__ERROR__************************'
      PRINT *,' Can not open file ',
     &                  FNAME (1:INDEX(FNAME,' ')-1),' on Unit',IU
      PRINT *,' IOSTAT=',IERR
      PRINT *,'Abnormal Termination of Delete_File_Subroutine'
      RETURN 1
C*******************************************************************C
 1000 RETURN
      END
C_____________________________________________________________________C
      SUBROUTINE CLOSE_FILE (FNAME,*)
C---------------------------------------------------------------------
C
C---VERSION 2.0 12MARCH1990
C
C:::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::
C
C .. Purpose:
C
C  THIS ROUTINE CLOSES A SINGLE FILE.
C
C
C:::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::
C
C .. Language: Fortran77
C
C
C    Inputs:
C
C  FNAME = FILE NAME
C
C .. History:
C
C      Leonard L. Orzol      03/13/90      Original Coding
C               USGS WRD Portland, Or Fts: 429-2256
C
C---------------------------------------------------------------------
C
      CHARACTER*80 FNAME
      INTEGER IERR
```

```
      LOGICAL EXISTS,OPN
C*********************************************************************C
C
C1-----Inquire About Existing File
C
      INQUIRE (FILE=FNAME,IOSTAT=IERR,ERR=9999,
     &                              EXIST=EXISTS,OPENED=OPN,NUMBER=IU)
C
C1-----Existence of File
C
      IF(.NOT.EXISTS) THEN
         PRINT *,'System File ',FNAME (1:INDEX(FNAME,' ')-1),' does not e
     &xist'
         RETURN
      ELSE
       IF(OPN) THEN
          CLOSE (IU,STATUS='KEEP',ERR=8888,IOSTAT=IERR)
       ENDIF
        RETURN
      ENDIF
C*********************************************************************C
C                        Report errors
C*********************************************************************C
 8888 PRINT *,' *****ERROR*****'
      PRINT *,' Can not close file ',
     &                  FNAME (1:INDEX(FNAME,' ')-1),' Unit',IU
      PRINT *,' IOSTAT=',IERR
      PRINT *,'Abnormal Termination of Close_File_Subroutine'
      RETURN 1
C
 9999 PRINT *,' *****ERROR*****'
      PRINT *,' Can not inquire on file ',
     &                  FNAME (1:INDEX(FNAME,' ')-1),' Unit',IU
      PRINT *,' IOSTAT=',IERR
      PRINT *,'Abnormal Termination of Close_File_Subroutine'
      RETURN 1
C*********************************************************************C
 1000 RETURN
      END
```

```
/*-------------------------------------------------------------------------
/*
/*  Command name:           DRIVER.AML
/*  Version:                1.0
/*  Language:               Arc Macro Language
/*  Arc Version/Platform:   6.0 / DGUX
/*  Subsystem:              Arc
/*
/*:::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::
/*
/*  Purpose: This aml sets &amlpath and global variables and then runs
/*           the series of NAWDEX amls.
/*
/*:::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::
/*
/*  Arguments:
/*
/*   Variable name        Type     Definition
/*   ------------------------------------------------------------
/*   .state               char     2 letter state abbreviation
/*
/*:::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::
/*
/*  Programs or menus called: NONGEO.AML, MIS_DUP.AML, GEO.AML, REPORT.AML
/*
/*:::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::
/*
/*  History:
/*
/*  Author/Site          Date     Version   Event
/*  ------------------------------------------------------------
/*  Harrison/USGS-OR     8-91     1.0       Original coding
/*
/*:::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::
/*
/* Disclaimer:
/*  Although these programs have been used by the U.S. Geological Survey, no
/*  warranty, expressed or implied, is made by the USGS as to the accuracy
/*  or functioning of these programs.  No responsibility is assumed by the
/*  USGS in connection with the distribution or use of these programs.
/*
/*-------------------------------------------------------------------------
/*
&args .state
&severity &error &routine get_out
&if [null %.state%] &then &do
  &type Usage:  DRIVER.AML <STATE_ABBREV>
  &type Valid state abbreviations are:
  &type   AL Alabama, AK Alaska, AZ Arizona, AR Arkansas,
  &type   CA California, CO Colorado, CT Connecticut, DE Delaware,
  &type   DC District of Columbia, FL Florida, GA Georgia, GU Guam,
  &type   HI Hawaii, ID Idaho, IL Illinois, IN Indiana, IA Iowa, KS Kansas,
  &type   LA Louisiana, ME Maine, MD Maryland, MA Massachusetts,
  &type   MI Michigan, MN Minnesota, MS Mississippi, MT Montana,
  &type   NE Nebraska, NV Nevada, NH New Hampshire, NJ New Jersey,
  &type   NM New Mexico, NY New York, NC North Carolina, ND North Dakota,
  &type   OH Ohio, OK Oklahoma, OR Oregon, PA Pennsylvania, PR Puerto Rico,
  &type   RI Rhode Island, SC South Carolina, SD South Dakota, TN Tennessee,
  &type   TX Texas, UT Utah,VI Virgin Islands, VT Vermont, VA Virginia,
```

```
  &type   WA Washington, WV West Virginia, WI Wisconsin, WY Wyoming
  &return
  &end
&select [locase [show program]]
  &when arc
    &do
      &type
      &type
      &type//////////////////////////////////////////////////////////////////////
      &type
      &type Disclaimer:
      &type
      &type Although these programs have been used by the U.S. Geological Survey,
      &type no warranty, expressed or implied, is made by the USGS as to the
      &type accuracy or functioning of these programs.  No responsibility is
      &type assumed by the USGS in connection with the distribution or use of
      &type these programs.
      &type
      &type //////////////////////////////////////////////////////////////////////
      &type
      &type DRIVER.AML :  Version 1.0  :  [date -full]
      &type
      &s tube [extract 1 [show &term]]
      &if [null %tube%] &then
        &do
          &term 9999 &mouse
          display 9999 position ul screen
        &end
    &end
  &otherwise
    &do
      &type This program is run from ARC prompt ...
      &stop
    &end
&end
/*
/*
&s .home /reach/nawdex
&s .dt [date -full]
&s .usr [username]
&amlpath %.home%/amls
/*
/*
&if ^ [exists %.state% -dir] &then &do
  &type "%.state%" state directory NOT found
  &type     Has INSTALL.AML been run?
  &type     Is this a valid state code? (see usage for list)
  &stop
  &end
&workspace [locase %.state%]
&s .state = [TRANSLATE %.state%]
&if ^ [exists loc -cov] &then &do
  &type Points coverage (loc) NOT found
  &type Bailing out of DRIVER.AML ...
  &workspace %.home%
  &stop
  &end
&describe loc
&if %dsc$points% = 0 &then &do
```

```
  &type Coverage "loc" has no points
  &type Bailing out of DRIVER.AML ...
  &workspace %.home%
  &stop
&end
&if ^ [exists crd_data -file] &then &do
  &type Coordinate file (crd_data) NOT found
  &type Bailing out of CONTROL.AML ...
  &workspace %.home%
  &stop
  &end
&type
&type
&type ////////////////////////////////////////////////////////////
&type
&type Now verifying NAWDEX data base code entries (NONGEO.AML) ...
&type
&r nongeo.aml
/*
/*
&type
&type
&type ////////////////////////////////////////////////////////////
&type
&type Now identifying NAWDEX sites with duplicate and missing
&type        geographic coordinates (MIS_DUP.AML) ...
&type
&r mis_dup.aml
/*
/*
&type
&type
&typ ////////////////////////////////////////////////////////////
&type
&type Now identifying mislocated NAWDEX sites (GEO.AML) ...
&type
&r geo.aml
/*
/*
&type
&type
&type ////////////////////////////////////////////////////////////
&type
&type Now producing INFO reports (REPORTS.AML) ...
&type
&r reports.aml
/*
/*
/* Updating project status file
/*
&workspace %.home%/reference
&data arc info
ARC
SEL STATUS
RES STATE CN [quote %.state%]
PURGE
Y
ADD
[unquote %.state%]
```

```
[unquote %.usr%]
[unquote %.dt%]
[unquote ' ']
ASEL
SORT ON STATE
Q STOP
&end
&workspace %.home%
/*
/*
&type
&type
&type ================================================================================
&type
&type                    All AML's have run successfully!!
&type            Now run PRINT.AML to output reports for mailing
&type
&type ================================================================================
&type
quit       /* exiting arc
&return
/*
/*
&routine get_out
&type
&type
&type ***************  FAILURE ************************
&type
&type There has been a failure in one of the NAWDEX amls
&type   See CHK file in state directory for details
&type
&type ************************************************
&type
&workspace %.home%
&s cerr [close -all]
quit       /* exit arc
&stop
```

```
/*-----------------------------------------------------------------------
/*
/*  Command name:           NONGEO.AML
/*  Version:                1.1
/*  Language:               Arc Macro Language
/*  Arc Version/Platform:   6.0 / DGUX
/*  Subsystem:              Arc
/*
/*:::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::
/*
/*  Purpose: To identify non-geographical coding errors in NAWDEX MWDI
/*
/*:::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::
/*
/*  Arguments: None
/*
/*:::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::
/*
/*  Programs or menus called: Called by DRIVER.AML
/*
/*:::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::
/*
/*  History:
/*
/*  Author/Site           Date     Version   Event
/*  ---------------------------------------------------------------
/*  Harrison/USGS-OR      7-91     1.0       Original coding
/*  Harrison/USGS-OR      8-91     1.1       Removed blank fields and
/*                                           replaced with 9's
/*
/*:::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::
/*
/* Disclaimer:
/*  Although this program has been used by the U.S. Geological Survey, no
/*  warranty, expressed or implied, is made by the USGS as to the accuracy
/*  or functioning of the program.  No responsibility is assumed by the
/*  USGS in connection with this program's distribution or use.
/*
/*-----------------------------------------------------------------------
/*
&severity &error &routine get_out
&type
&type ============================================================
&type
&type NONGEO.AML :  Version 1.1  :  [date -full]
&type
&type ============================================================
&type
/*
/*
&s path [dir [pathname workspace]]
/*
/* Cleaning up
/*
&if [exists errors -file] &then &sys rm errors
&if [exists site_type.codes -info] &then infodelete site_type.codes
&if [exists primary_use.codes -info] &then infodelete primary_use.codes
&if [exists appendix_a.codes -info] &then infodelete appendix_a.codes
&if [exists appendix_b.codes -info] &then infodelete appendix_b.codes
&if [exists stage.codes -info] &then infodelete stage.codes
&if [exists cmplt_flow.codes -info] &then infodelete cmplt_flow.codes
&if [exists peak_flow.codes -info] &then infodelete peak_flow.codes
&if [exists low_flow.codes -info] &then infodelete low_flow.codes
&if [exists volume.codes -info] &then infodelete volume.codes
&if [exists unit1.codes -info] &then infodelete unit1.codes
```

```
&if [exists unit2.codes -info] &then infodelete unit2.codes
&if [exists sw_other.codes -info] &then infodelete sw_other.codes
&if [exists telemetry.codes -info] &then infodelete telemetry.codes
&if [exists sw_rec_type.codes -info] &then infodelete sw_rec_type.codes
&if [exists rec_type.codes -info] &then infodelete rec_type.codes
&if [exists rec_freq.codes -info] &then infodelete rec_freq.codes
&if [exists pn.codes -info] &then infodelete pn.codes
&if [exists non_us_cntry.codes -info] &then infodelete non_us_cntry.codes
&if [exists aquifer_type.codes -info] &then infodelete aquifer_type.codes
/*
/* NOTE: Fields containing all nines are empty
/*
&data arc info
ARC
CA $NM = 1
CA $PRINTER-SIZE = 200
REM
REM
REM
REM================== CHECKING LOC.PAT INFO FILE ====================================
SEL LOC.PAT
RES NAWDEX-ID CN '999999999999999999999'
OUTPUT %path%/errors INIT
PRINT 1T,NAWDEX_AGCY,'!',AGCY_STA_NO,'!',STATION_NAME,'!',STATE,'!',~
'NAWDEX-ID','!',NAWDEX-ID,'!','Missing mandatory code','!'
REM-------------------------------------------------------------------------
ASEL
RES NAWDEX_AGCY CN '99999'
OUTPUT %path%/errors APPEND
PRINT 1T,NAWDEX_AGCY,'!',AGCY_STA_NO,'!',STATION_NAME,'!',STATE,'!',~
'NAWDEX_AGCY','!',NAWDEX_AGCY,'!','Missing mandatory code','!'
REM-------------------------------------------------------------------------
ADIR /REACH/NAWDEX/REFERENCE/INFO
TAKE DATA ARC NON_US_CNTRY.CODES
SEL LOC.PAT
RELATE NON_US_CNTRY.CODES BY NON_US_COUNTRY ORDER
RES NON_US_COUNTRY NC '99' AND NON_US_COUNTRY NE $1NON_US_COUNTRY
OUTPUT %path%/errors APPEND
PRINT 1T,NAWDEX_AGCY,'!',AGCY_STA_NO,'!',STATION_NAME,'!',STATE,'!',~
'NON_US_COUNTRY','!',NON_US_COUNTRY,'!','Invalid code (MX,RP,CA,BLANK)','!'
RELATE
REM-------------------------------------------------------------------------
ASEL
RES SITE_TYPE CN '99'
OUTPUT %path%/errors APPEND
PRINT 1T,NAWDEX_AGCY,'!',AGCY_STA_NO,'!',STATION_NAME,'!',STATE,'!',~
'SITE_TYPE','!',SITE_TYPE,'!','Missing mandatory code','!'
REM-------------------------------------------------------------------------
ADIR /REACH/NAWDEX/REFERENCE/INFO
TAKE DATA ARC SITE_TYPE.CODES
SEL LOC.PAT
RELATE SITE_TYPE.CODES BY SITE_TYPE ORDER
RES SITE_TYPE NE $1SITE_TYPE AND SITE_TYPE NC '99'
OUTPUT %path%/errors APPEND
PRINT 1T,NAWDEX_AGCY,'!',AGCY_STA_NO,'!',STATION_NAME,'!',STATE,'!',~
'SITE_TYPE','!',SITE_TYPE,'!','Invalid code (see USGS OFR 82-327)','!'
RELATE
REM-------------------------------------------------------------------------
ASEL
RES BASIN_DESCRP NC '999' AND BASIN_DESCRP GT 124
OUTPUT %path%/errors APPEND
PRINT 1T,NAWDEX_AGCY,'!',AGCY_STA_NO,'!',STATION_NAME,'!',STATE,'!',~
'BASIN_DESCRP','!',BASIN_DESCRP,'!','Value exceeds 124','!'
REM-------------------------------------------------------------------------
ASEL
```

```
RES NC_AREA NC 'Y' AND NC_AREA NC 'N' AND NC_AREA NC '9'
OUTPUT %path%/errors APPEND
PRINT 1T,NAWDEX_AGCY,'!',AGCY_STA_NO,'!',STATION_NAME,'!',STATE,'!',~
'NC_AREA','!',NC_AREA,'!','Invalid code (Y,N,BLANK)','!'
REM-----------------------------------------------------------------------
ASEL
RES LAST_UPDATE CN '999999'
OUTPUT %path%/errors APPEND
PRINT 1T,NAWDEX_AGCY,'!',AGCY_STA_NO,'!',STATION_NAME,'!',STATE,'!',~
'LAST_UPDATE','!',LAST_UPDATE,'!','Missing mandatory date','!'
REM-----------------------------------------------------------------------
ASEL
RES STATE_COUNTY CN '99999'
OUTPUT %path%/errors APPEND
PRINT 1T,NAWDEX_AGCY,'!',AGCY_STA_NO,'!',STATION_NAME,'!',STATE,'!',~
'STATE_COUNTY','!',STATE_COUNTY,'!','Missing mandatory code','!'
REM-----------------------------------------------------------------------
ADIR /REACH/NAWDEX/REFERENCE/INFO
TAKE DATA ARC PRIMARY_USE.CODES
SEL LOC.PAT
RELATE PRIMARY_USE.CODES BY PRIMARY_USE ORDER
RES PRIMARY_USE NC '9' AND PRIMARY_USE NE $1PRIMARY_USE
OUTPUT %path%/errors APPEND
PRINT 1T,NAWDEX_AGCY,'!',AGCY_STA_NO,'!',STATION_NAME,'!',STATE,'!',~
'PRIMARY_USE','!',PRIMARY_USE,'!','Invalid code (see USGS OFR 82-327)','!'
RELATE
REM-----------------------------------------------------------------------
ASEL
RES WRD_ACCT NC 'Y' AND WRD_ACCT NC 'N' AND WRD_ACCT NC '9'
OUTPUT %path%/errors APPEND
PRINT 1T,NAWDEX_AGCY,'!',AGCY_STA_NO,'!',STATION_NAME,'!',STATE,'!',~
'WRD_ACCT','!',WRD_ACCT,'!','Invalid code (Y,N,BLANK)','!'
REM-----------------------------------------------------------------------
ASEL
RES OTHER_DATA NC '999999' AND OTHER_DATA GT 123456
OUTPUT %path%/errors APPEND
PRINT 1T,NAWDEX_AGCY,'!',AGCY_STA_NO,'!',STATION_NAME,'!',STATE,'!',~
'OTHER_DATA','!',OTHER_DATA,'!','Value exceeds 123456','!'
REM-----------------------------------------------------------------------
ASEL
RES SW_ACTIVE NC 'Y' AND SW_ACTIVE NC 'N' AND SW_ACTIVE NC '9'
OUTPUT %path%/errors APPEND
PRINT 1T,NAWDEX_AGCY,'!',AGCY_STA_NO,'!',STATION_NAME,'!',STATE,'!',~
'SW_ACTIVE','!',SW_ACTIVE,'!','Invalid code (Y,N,BLANK)','!'
REM-----------------------------------------------------------------------
ASEL
RES GW_ACTIVE NC 'Y' AND GW_ACTIVE NC 'N' AND GW_ACTIVE NC '9'
OUTPUT %path%/errors APPEND
PRINT 1T,NAWDEX_AGCY,'!',AGCY_STA_NO,'!',STATION_NAME,'!',STATE,'!',~
'GW_ACTIVE','!',GW_ACTIVE,'!','Invalid code (Y,N,BLANK)','!'
REM-----------------------------------------------------------------------
ASEL
RES QW_ACTIVE NC 'Y' AND QW_ACTIVE NC 'N' AND QW_ACTIVE NC '9'
OUTPUT %path%/errors APPEND
PRINT 1T,NAWDEX_AGCY,'!',AGCY_STA_NO,'!',STATION_NAME,'!',STATE,'!',~
'QW_ACTIVE','!',QW_ACTIVE,'!','Invalid code (Y,N,BLANK)','!'
REM-----------------------------------------------------------------------
ASEL
RES BIO_ACTIVE NC 'Y' AND BIO_ACTIVE NC 'N' AND BIO_ACTIVE NC '9'
OUTPUT %path%/errors APPEND
PRINT 1T,NAWDEX_AGCY,'!',AGCY_STA_NO,'!',STATION_NAME,'!',STATE,'!',~
'BIO_ACTIVE','!',BIO_ACTIVE,'!','Invalid code (Y,N,BLANK)','!'
REM-----------------------------------------------------------------------
ASEL
RES PHY_ACTIVE NC 'Y' AND PHY_ACTIVE NC 'N' AND PHY_ACTIVE NC '9'
```

```
OUTPUT %path%/errors APPEND
PRINT 1T,NAWDEX_AGCY,'!',AGCY_STA_NO,'!',STATION_NAME,'!',STATE,'!',~
'PHY_ACTIVE','!',PHY_ACTIVE,'!','Invalid code (Y,N,BLANK)','!'
REM--------------------------------------------------------------------------
ASEL
RES SED_ACTIVE NC 'Y' AND SED_ACTIVE NC 'N' AND SED_ACTIVE NC '9'
OUTPUT %path%/errors APPEND
PRINT 1T,NAWDEX_AGCY,'!',AGCY_STA_NO,'!',STATION_NAME,'!',STATE,'!',~
'SED_ACTIVE','!',SED_ACTIVE,'!','Invalid code (Y,N,BLANK)','!'
REM--------------------------------------------------------------------------
ASEL
RES CHM_ACTIVE NC 'Y' AND CHM_ACTIVE NC 'N' AND CHM_ACTIVE NC '9'
OUTPUT %path%/errors APPEND
PRINT 1T,NAWDEX_AGCY,'!',AGCY_STA_NO,'!',STATION_NAME,'!',STATE,'!',~
'CHM_ACTIVE','!',CHM_ACTIVE,'!','Invalid code (Y,N,BLANK)','!'
REM--------------------------------------------------------------------------
ASEL
RES MET_ACTIVE NC 'Y' AND MET_ACTIVE NC 'N' AND MET_ACTIVE NC '9'
OUTPUT %path%/errors APPEND
PRINT 1T,NAWDEX_AGCY,'!',AGCY_STA_NO,'!',STATION_NAME,'!',STATE,'!',~
'MET_ACTIVE','!',MET_ACTIVE,'!','Invalid code (Y,N,BLANK)','!'
REM
REM
REM
REM============== CHECKING SW_DATA INFO FILE ========================================
ASEL
RELATE SW_DATA SW_KEY LINK
RES $RELREC1 NE 0
RES $1SW_BEGIN_YR LT 1850 OR $1SW_BEGIN_YR GT 1991 AND $1SW_BEGIN_YR NC '9999'
OUTPUT %path%/errors APPEND
PRINT 1T,NAWDEX_AGCY,'!',AGCY_STA_NO,'!',STATION_NAME,'!',STATE,'!',~
'SW_BEGIN_YR','!',$1SW_BEGIN_YR,'!','Invalid date','!'
REM--------------------------------------------------------------------------
ASEL
RES $RELREC1 NE 0
RES $1SW_END_YR LT 1850 OR $1SW_END_YR GT 1991 AND $1SW_END_YR NC '9999'
OUTPUT %path%/errors APPEND
PRINT 1T,NAWDEX_AGCY,'!',AGCY_STA_NO,'!',STATION_NAME,'!',STATE,'!',~
'SW_END_YR','!',$1SW_END_YR,'!','Invalid date','!'
REM--------------------------------------------------------------------------
ASEL
RES $RELREC1 NE 0
RES $1SW_INTERRUPTED NC 'Y' AND $1SW_INTERRUPTED NC '9'
OUTPUT %path%/errors APPEND
PRINT 1T,NAWDEX_AGCY,'!',AGCY_STA_NO,'!',STATION_NAME,'!',STATE,'!',~
'SW_INTERRUPTED','!',$1SW_INTERRUPTED,'!','Invalid code (Y,BLANK)','!'
REM--------------------------------------------------------------------------
ASEL
RES $RELREC1 NE 0
RES $1SW_RECMD_MTHDS NC '9' AND $1SW_RECMD_MTHDS NC 'Y' AND $1SW_RECMD_MTHDS NC 'N'
OUTPUT %path%/errors APPEND
PRINT 1T,NAWDEX_AGCY,'!',AGCY_STA_NO,'!',STATION_NAME,'!',STATE,'!',~
'SW_RECMD_MTHDS','!',$1SW_RECMD_MTHDS,'!','Invalid code (Y,N,BLANK)','!'
REM--------------------------------------------------------------------------
ASEL
RES $RELREC1 NE 0
RES $1SW_LST_UPDATE CN '9999'
OUTPUT %path%/errors APPEND
PRINT 1T,NAWDEX_AGCY,'!',AGCY_STA_NO,'!',STATION_NAME,'!',STATE,'!',~
'SW_LST_UPDATE','!',$1SW_LST_UPDATE,'!','Missing mandatory date','!'
REM--------------------------------------------------------------------------
ASEL
RES $RELREC1 NE 0
RES $1SW_LST_UPDATE NC '9999' AND $1SW_LST_UPDATE LT 1000 OR $1SW_LST_UPDATE GT 9200
OUTPUT %path%/errors APPEND
```

```
PRINT 1T,NAWDEX_AGCY,'!',AGCY_STA_NO,'!',STATION_NAME,'!',STATE,'!',~
'SW_LST_UPDATE','!',$1SW_LST_UPDATE,'!','Invalid date','!'
RELATE
REM-----------------------------------------------------------------------
ADIR /REACH/NAWDEX/REFERENCE/INFO
TAKE DATA ARC APPENDIX_A.CODES
SEL SW_DATA
RELATE APPENDIX_A.CODES BY COMPLETE_STAGE ORDER
RES COMPLETE_STAGE NC '9' AND COMPLETE_STAGE NE $1COMPLETE_STAGE
RELATE LOC.PAT 2 NAWDEX# ORDER
OUTPUT %path%/errors APPEND
PRINT 1T,$2NAWDEX_AGCY,'!',$2AGCY_STA_NO,'!',$2STATION_NAME,'!',$2STATE,'!',~
'COMPLETE_STAGE','!',COMPLETE_STAGE,'!','Invalid code (see APPENDIX A,USGS OFR 82-327)','!'
RELATE
REM-----------------------------------------------------------------------
ADIR /REACH/NAWDEX/REFERENCE/INFO
TAKE DATA ARC STAGE.CODES
SEL SW_DATA
RELATE STAGE.CODES BY PEAK_STAGE ORDER
RES PEAK_STAGE NC '9' AND PEAK_STAGE NE $1PEAK_STAGE
RELATE LOC.PAT 2 NAWDEX# ORDER
OUTPUT %path%/errors APPEND
PRINT 1T,$2NAWDEX_AGCY,'!',$2AGCY_STA_NO,'!',$2STATION_NAME,'!',$2STATE,'!',~
'PEAK_STAGE','!',PEAK_STAGE,'!','Invalid code (1,2,E,BLANK)','!'
RELATE
REM-----------------------------------------------------------------------
ASEL
RELATE STAGE.CODES BY LOW_STAGE ORDER
RES LOW_STAGE NC '9' AND LOW_STAGE NE $1LOW_STAGE
RELATE LOC.PAT 2 NAWDEX# ORDER
OUTPUT %path%/errors APPEND
PRINT 1T,$2NAWDEX_AGCY,'!',$2AGCY_STA_NO,'!',$2STATION_NAME,'!',$2STATE,'!',~
'LOW_STAGE','!',LOW_STAGE,'!','Invalid code (1,2,E,BLANK)','!'
RELATE
REM-----------------------------------------------------------------------
ADIR /REACH/NAWDEX/REFERENCE/INFO
TAKE DATA ARC APPENDIX_B.CODES
SEL SW_DATA
RELATE APPENDIX_B.CODES BY STAGE_MED ORDER
RES STAGE_MED NC '9' AND STAGE_MED NE $1STAGE_MED
RELATE LOC.PAT 2 NAWDEX# ORDER
OUTPUT %path%/errors APPEND
PRINT 1T,$2NAWDEX_AGCY,'!',$2AGCY_STA_NO,'!',$2STATION_NAME,'!',$2STATE,'!',~
'STAGE_MED','!',STAGE_MED,'!','Invalid code (see APPENDIX B,USGS OFR 82-327)','!'
RELATE
REM-----------------------------------------------------------------------
ADIR /REACH/NAWDEX/REFERENCE/INFO
TAKE DATA ARC CMPLT_FLOW.CODES
SEL SW_DATA
RELATE CMPLT_FLOW.CODES BY COMPLETE_FLOW ORDER
RES COMPLETE_FLOW NC '9' AND COMPLETE_FLOW NE $1COMPLETE_FLOW
RELATE LOC.PAT 2 NAWDEX# ORDER
OUTPUT %path%/errors APPEND
PRINT 1T,$2NAWDEX_AGCY,'!',$2AGCY_STA_NO,'!',$2STATION_NAME,'!',$2STATE,'!',~
'COMPLETE_FLOW','!',COMPLETE_FLOW,'!','Invalid code (1,2,3,4,E)','!'
RELATE
REM-----------------------------------------------------------------------
ADIR /REACH/NAWDEX/REFERENCE/INFO
TAKE DATA ARC PEAK_FLOW.CODES
SEL SW_DATA
RELATE PEAK_FLOW.CODES BY PEAK_FLOW ORDER
RES PEAK_FLOW NC '9' AND PEAK_FLOW NE $1PEAK_FLOW
RELATE LOC.PAT 2 NAWDEX# ORDER
OUTPUT %path%/errors APPEND
PRINT 1T,$2NAWDEX_AGCY,'!',$2AGCY_STA_NO,'!',$2STATION_NAME,'!',$2STATE,'!',~
```

```
'PEAK_FLOW','!',PEAK_FLOW,'!','Invalid code (1,2,8,9,E)','!'
RELATE
REM---------------------------------------------------------------------------
ADIR /REACH/NAWDEX/REFERENCE/INFO
TAKE DATA ARC LOW_FLOW.CODES
SEL SW_DATA
RELATE LOW_FLOW.CODES BY LOW_FLOW ORDER
RES LOW_FLOW NC '9' AND LOW_FLOW NE $1LOW_FLOW
RELATE LOC.PAT 2 NAWDEX# ORDER
OUTPUT %path%/errors APPEND
PRINT 1T,$2NAWDEX_AGCY,'!',$2AGCY_STA_NO,'!',$2STATION_NAME,'!',$2STATE,'!',~
'LOW_FLOW','!',LOW_FLOW,'!','Invalid code (1,2,9,E)','!'
RELATE
REM---------------------------------------------------------------------------
ASEL
RELATE APPENDIX_A.CODES BY MISC_FLOW_MEAS ORDER
RES MISC_FLOW_MEAS NC '9' AND MISC_FLOW_MEAS NE $1MISC_FLOW_MEAS
RELATE LOC.PAT 2 NAWDEX# ORDER
OUTPUT %path%/errors APPEND
PRINT 1T,$2NAWDEX_AGCY,'!',$2AGCY_STA_NO,'!',$2STATION_NAME,'!',$2STATE,'!',~
'MISC_FLOW_MEAS','!',MISC_FLOW_MEAS,'!','Invalid code (see APPENDIX A,USGS OFR 82-327)','!'
RELATE
REM---------------------------------------------------------------------------
ASEL
RELATE APPENDIX_B.CODES BY FLOW_MED ORDER
RES FLOW_MED NC '9' AND FLOW_MED NE $1FLOW_MED
RELATE LOC.PAT 2 NAWDEX# ORDER
OUTPUT %path%/errors APPEND
PRINT 1T,$2NAWDEX_AGCY,'!',$2AGCY_STA_NO,'!',$2STATION_NAME,'!',$2STATE,'!',~
'FLOW_MED','!',FLOW_MED,'!','Invalid code (see APPENDIX B,USGS OFR 82-327)','!'
RELATE
REM---------------------------------------------------------------------------
ADIR /REACH/NAWDEX/REFERENCE/INFO
TAKE DATA ARC VOLUME.CODES
SEL SW_DATA
RELATE VOLUME.CODES BY VOLUME ORDER
RES VOLUME NC '9' AND VOLUME NE $1VOLUME
RELATE LOC.PAT 2 NAWDEX# ORDER
OUTPUT %path%/errors APPEND
PRINT 1T,$2NAWDEX_AGCY,'!',$2AGCY_STA_NO,'!',$2STATION_NAME,'!',$2STATE,'!',~
'VOLUME','!',VOLUME,'!','Invalid code (1,3,9,E)','!'
RELATE
REM---------------------------------------------------------------------------
ASEL
RELATE VOLUME.CODES BY VOLUME_CHANGE
RES VOLUME_CHANGE NC '9' AND VOLUME_CHANGE NE $1VOLUME_CHANGE
RELATE LOC.PAT 2 NAWDEX# ORDER
OUTPUT %path%/errors APPEND
PRINT 1T,$2NAWDEX_AGCY,'!',$2AGCY_STA_NO,'!',$2STATION_NAME,'!',$2STATE,'!',~
'VOLUME_CHANGE','!',VOLUME_CHANGE,'!','Invalid code (1,3,9,E)','!'
RELATE
REM---------------------------------------------------------------------------
ASEL
RELATE APPENDIX_B.CODES BY VOLUME_MED ORDER
RES VOLUME_MED NC '9' AND VOLUME_MED NE $1VOLUME_MED
RELATE LOC.PAT 2 NAWDEX# ORDER
OUTPUT %path%/errors APPEND
PRINT 1T,$2NAWDEX_AGCY,'!',$2AGCY_STA_NO,'!',$2STATION_NAME,'!',$2STATE,'!',~
'VOLUME_MED','!',VOLUME_MED,'!','Invalid code (see APPENDIX B,USGS OFR 82-327)','!'
RELATE
REM---------------------------------------------------------------------------
ADIR /REACH/NAWDEX/REFERENCE/INFO
TAKE DATA ARC UNIT1.CODES
SEL SW_DATA
RELATE UNIT1.CODES BY SW_UNIT_FLOW ORDER
```

```
RES SW_UNIT_FLOW NC '9' AND SW_UNIT_FLOW NE $1SW_UNIT_FLOW
RELATE LOC.PAT 2 NAWDEX# ORDER
OUTPUT %path%/errors APPEND
PRINT 1T,$2NAWDEX_AGCY,'!',$2AGCY_STA_NO,'!',$2STATION_NAME,'!',$2STATE,'!',~
'SW_UNIT_FLOW','!',SW_UNIT_FLOW,'!','Invalid code (A - R, BLANK)','!'
RELATE
REM-------------------------------------------------------------------------
ADIR /REACH/NAWDEX/REFERENCE/INFO
TAKE DATA ARC UNIT2.CODES
SEL SW_DATA
RELATE UNIT2.CODES BY SW_UNIT_STAGE ORDER
RES SW_UNIT_STAGE NC '9' AND SW_UNIT_STAGE NE $1SW_UNIT_STAGE
RELATE LOC.PAT 2 NAWDEX# ORDER
OUTPUT %path%/errors APPEND
PRINT 1T,$2NAWDEX_AGCY,'!',$2AGCY_STA_NO,'!',$2STATION_NAME,'!',$2STATE,'!',~
'SW_UNIT_STAGE','!',SW_UNIT_STAGE,'!','Invalid code (A - S, BLANK)','!'
RELATE
REM-------------------------------------------------------------------------
ASEL
RELATE UNIT2.CODES BY SW_UNIT_VOLUME ORDER
RES SW_UNIT_VOLUME NC '9' AND SW_UNIT_VOLUME NE $1SW_UNIT_VOLUME
RELATE LOC.PAT 2 NAWDEX# ORDER
OUTPUT %path%/errors APPEND
PRINT 1T,$2NAWDEX_AGCY,'!',$2AGCY_STA_NO,'!',$2STATION_NAME,'!',$2STATE,'!',~
'SW_UNIT_VOLUME','!',SW_UNIT_VOLUME,'!','Invalid code (A - S, BLANK)','!'
RELATE
REM-------------------------------------------------------------------------
ADIR /REACH/NAWDEX/REFERENCE/INFO
TAKE DATA ARC TELEMETRY.CODES
SEL SW_DATA
RELATE TELEMETRY.CODES BY SW_TELEMETRY ORDER
RES SW_TELEMETRY NC '9' AND SW_TELEMETRY NE $1SW_TELEMETRY
RELATE LOC.PAT 2 NAWDEX# ORDER
OUTPUT %path%/errors APPEND
PRINT 1T,$2NAWDEX_AGCY,'!',$2AGCY_STA_NO,'!',$2STATION_NAME,'!',$2STATE,'!',~
'SW_TELEMETRY','!',SW_TELEMETRY,'!','Invalid code (1 - 8)','!'
RELATE
REM-------------------------------------------------------------------------
ADIR /REACH/NAWDEX/REFERENCE/INFO
TAKE DATA ARC SW_REC_TYPE.CODES
SEL SW_DATA
RELATE SW_REC_TYPE.CODES BY SW_RECORDER_TYPE ORDER
RES SW_RECORDER_TYPE NC '9' AND SW_RECORDER_TYPE NE $1SW_RECORDER_TYPE
RELATE LOC.PAT 2 NAWDEX# ORDER
OUTPUT %path%/errors APPEND
PRINT 1T,$2NAWDEX_AGCY,'!',$2AGCY_STA_NO,'!',$2STATION_NAME,'!',$2STATE,'!',~
'SW_RECORDER_TYPE','!',SW_RECORDER_TYPE,'!','Invalid code (A,B,C,BLANK)','!'
RELATE
REM-------------------------------------------------------------------------
ADIR /REACH/NAWDEX/REFERENCE/INFO
TAKE DATA ARC REC_FREQ.CODES
SEL SW_DATA
RELATE REC_FREQ.CODES BY SW_RECORDER_FREQ ORDER
RES SW_RECORDER_FREQ NC '9' AND SW_RECORDER_FREQ NE $1SW_RECORDER_FREQ
RELATE LOC.PAT 2 NAWDEX# ORDER
OUTPUT %path%/errors APPEND
PRINT 1T,$2NAWDEX_AGCY,'!',$2AGCY_STA_NO,'!',$2STATION_NAME,'!',$2STATE,'!',~
'SW_RECORDER_FREQ','!',SW_RECORDER_FREQ,'!','Invalid code (A - T, BLANK)','!'
RELATE
REM-------------------------------------------------------------------------
ADIR /REACH/NAWDEX/REFERENCE/INFO
TAKE DATA ARC PN.CODES
SEL SW_DATA
RELATE PN.CODES BY SW_PN_CODE ORDER
RES SW_PN_CODE NC '9' AND SW_PN_CODE NE $1SW_PN_CODE
```

```
RELATE LOC.PAT 2 NAWDEX# ORDER
OUTPUT %path%/errors APPEND
PRINT 1T,$2NAWDEX_AGCY,'!',$2AGCY_STA_NO,'!',$2STATION_NAME,'!',$2STATE,'!',~
'SW_PN_CODE','!',SW_PN_CODE,'!','Invalid code (B,C,D,R,1,2,3,4,BLANK)','!'
RELATE
REM
REM
REM
REM============== CHECKING GW_DATA INFO FILE ======================================
SEL LOC.PAT
REL GW_DATA GW_KEY LINK
RES $RELREC1 NE 0
RES $1GW_BEGIN_YR LT 1850 OR $1GW_BEGIN_YR GT 1991 AND $1GW_BEGIN_YR NC '9999'
OUTPUT %path%/errors APPEND
PRINT 1T,NAWDEX_AGCY,'!',AGCY_STA_NO,'!',STATION_NAME,'!',STATE,'!',~
'GW_BEGIN_YR','!',$1GW_BEGIN_YR,'!','Invalid date','!'
REM-------------------------------------------------------------------------
ASEL
RES $RELREC1 NE 0
RES $1GW_END_YR LT 1850 OR $1GW_END_YR GT 1991 AND $1GW_END_YR NC '9999'
OUTPUT %path%/errors APPEND
PRINT 1T,NAWDEX_AGCY,'!',AGCY_STA_NO,'!',STATION_NAME,'!',STATE,'!',~
'GW_END_YR','!',$1GW_END_YR,'!','Invalid date','!'
REM-------------------------------------------------------------------------
ASEL
RES $RELREC1 NE 0
RES $1GW_INTERRUPTED NC 'Y' AND $1GW_INTERRUPTED NC '9'
OUTPUT %path%/errors APPEND
PRINT 1T,NAWDEX_AGCY,'!',AGCY_STA_NO,'!',STATION_NAME,'!',STATE,'!',~
'GW_INTERRUPTED','!',$1GW_INTERRUPTED,'!','Invalid code (Y,BLANK)','!'
REM-------------------------------------------------------------------------
ASEL
RES $RELREC1 NE 0
RES $1GW_RECMD_MTHDS NC '9' AND $1GW_RECMD_MTHDS NC 'Y' AND $1GW_RECMD_MTHDS NC 'N'
OUTPUT %path%/errors APPEND
PRINT 1T,NAWDEX_AGCY,'!',AGCY_STA_NO,'!',STATION_NAME,'!',STATE,'!',~
'GW_RECMD_MTHDS','!',$1GW_RECMD_MTHDS,'!','Invalid code (Y,N,BLANK)','!'
REM-------------------------------------------------------------------------
ASEL
RES $RELREC1 NE 0
RES $1MAJOR_VAR GT 1234567 AND $1MAJOR_VAR NC '9999999'
OUTPUT %path%/errors APPEND
PRINT 1T,NAWDEX_AGCY,'!',AGCY_STA_NO,'!',STATION_NAME,'!',STATE,'!',~
'MAJOR_VAR','!',$1MAJOR_VAR,'!','Value exceeds 1234567'
REM-------------------------------------------------------------------------
ASEL
RES $RELREC1 NE 0
RES $1GW_LST_UPDATE CN '9999'
OUTPUT %path%/errors APPEND
PRINT 1T,NAWDEX_AGCY,'!',AGCY_STA_NO,'!',STATION_NAME,'!',STATE,'!',~
'GW_LST_UPDATE','!',$1GW_LST_UPDATE,'!','Missing mandatory date','!'
REM-------------------------------------------------------------------------
ASEL
RES $RELREC1 NE 0
RES $1GW_LST_UPDATE NC '9999' AND $1GW_LST_UPDATE LT 1000 OR $1GW_LST_UPDATE GT 9200
OUTPUT %path%/errors APPEND
PRINT 1T,NAWDEX_AGCY,'!',AGCY_STA_NO,'!',STATION_NAME,'!',STATE,'!',~
'GW_LST_UPDATE','!',$1GW_LST_UPDATE,'!','Invalid date','!'
RELATE
REM-------------------------------------------------------------------------
ADIR /REACH/NAWDEX/REFERENCE/INFO
TAKE DATA ARC AQUIFER_TYPE.CODES
SEL GW_DATA
RELATE AQUIFER_TYPE.CODES BY AQUIFER_TYPE ORDER
RES AQUIFER_TYPE NC '9' AND AQUIFER_TYPE NE $1AQUIFER_TYPE
```

```
RELATE LOC.PAT 2 NAWDEX# ORDER
OUTPUT %path%/errors APPEND
PRINT 1T,$2NAWDEX_AGCY,'!',$2AGCY_STA_NO,'!',$2STATION_NAME,'!',$2STATE,'!',~
'AQUIFER_TYPE','!',AQUIFER_TYPE,'!','Invalid code (C,M,N,U,X,BLANK)','!'
RELATE
REM---------------------------------------------------------------------------
ASEL
RELATE APPENDIX_A.CODES BY LEVEL_FREQ ORDER
RES LEVEL_FREQ NC '9' AND LEVEL_FREQ NE $1LEVEL_FREQ
RELATE LOC.PAT 2 NAWDEX# ORDER
OUTPUT %path%/errors APPEND
PRINT 1T,$2NAWDEX_AGCY,'!',$2AGCY_STA_NO,'!',$2STATION_NAME,'!',$2STATE,'!',~
'LEVEL_FREQ','!',LEVEL_FREQ,'!','Invalid code (see APPENDIX A,USGS OFR 82-327)','!'
RELATE
REM---------------------------------------------------------------------------
ASEL
RELATE APPENDIX_B.CODES BY LEVEL_MED ORDER
RES LEVEL_MED NC '9' AND LEVEL_MED NE $1LEVEL_MED
RELATE LOC.PAT 2 NAWDEX# ORDER
OUTPUT %path%/errors APPEND
PRINT 1T,$2NAWDEX_AGCY,'!',$2AGCY_STA_NO,'!',$2STATION_NAME,'!',$2STATE,'!',~
'LEVEL_MED','!',LEVEL_MED,'!','Invalid code (see APPENDIX B,USGS OFR 82-327)','!'
RELATE
REM---------------------------------------------------------------------------
ASEL
RELATE APPENDIX_A.CODES BY DISCHRG_FREQ ORDER
RES DISCHRG_FREQ NC '9' AND DISCHRG_FREQ NE $1DISCHRG_FREQ
RELATE LOC.PAT 2 NAWDEX# ORDER
OUTPUT %path%/errors APPEND
PRINT 1T,$2NAWDEX_AGCY,'!',$2AGCY_STA_NO,'!',$2STATION_NAME,'!',$2STATE,'!',~
'DISCHRG_FREQ','!',DISCHRG_FREQ,'!','Invalid code (see APPENDIX A,USGS OFR 82-327)','!'
RELATE
REM---------------------------------------------------------------------------
ASEL
RELATE APPENDIX_B.CODES BY DISCHRG_MED ORDER
RES DISCHRG_MED NC '9' AND DISCHRG_MED NE $1DISCHRG_MED
RELATE LOC.PAT 2 NAWDEX# ORDER
OUTPUT %path%/errors APPEND
PRINT 1T,$2NAWDEX_AGCY,'!',$2AGCY_STA_NO,'!',$2STATION_NAME,'!',$2STATE,'!',~
'DISCHRG_MED','!',DISCHRG_MED,'!','Invalid code (see APPENDIX B,USGS OFR 82-327)','!'
RELATE
REM---------------------------------------------------------------------------
ASEL
RELATE APPENDIX_A.CODES BY SUBSIDE_FREQ ORDER
RES SUBSIDE_FREQ NC '9' AND SUBSIDE_FREQ NE $1SUBSIDE_FREQ
RELATE LOC.PAT 2 NAWDEX# ORDER
OUTPUT %path%/errors APPEND
PRINT 1T,$2NAWDEX_AGCY,'!',$2AGCY_STA_NO,'!',$2STATION_NAME,'!',$2STATE,'!',~
'SUBSIDE_FREQ','!',SUBSIDE_FREQ,'!','Invalid code (see APPENDIX A,USGS OFR 82-327)','!'
RELATE
REM---------------------------------------------------------------------------
ASEL
RELATE APPENDIX_B.CODES BY SUBSIDE_MED ORDER
RES SUBSIDE_MED NC '9' AND SUBSIDE_MED NE $1SUBSIDE_MED
RELATE LOC.PAT 2 NAWDEX# ORDER
OUTPUT %path%/errors APPEND
PRINT 1T,$2NAWDEX_AGCY,'!',$2AGCY_STA_NO,'!',$2STATION_NAME,'!',$2STATE,'!',~
'SUBSIDE_MED','!',SUBSIDE_MED,'!','Invalid code (see APPENDIX B,USGS OFR 82-327)','!'
RELATE
REM---------------------------------------------------------------------------
ASEL
RELATE TELEMETRY.CODES BY GW_TELEMETRY ORDER
RES GW_TELEMETRY NC '9' AND GW_TELEMETRY NE $1GW_TELEMETRY
RELATE LOC.PAT 2 NAWDEX# ORDER
OUTPUT %path%/errors APPEND
```

```
PRINT 1T,$2NAWDEX_AGCY,'!',$2AGCY_STA_NO,'!',$2STATION_NAME,'!',$2STATE,'!',~
'GW_TELEMETRY','!',GW_TELEMETRY,'!','Invalid code (1 - 8)','!'
RELATE
REM---------------------------------------------------------------------
ADIR /REACH/NAWDEX/REFERENCE/INFO
TAKE DATA ARC REC_TYPE.CODES
SEL GW_DATA
RELATE REC_TYPE.CODES BY GW_RECORDER_TYPE ORDER
RES GW_RECORDER_TYPE NC '9' AND GW_RECORDER_TYPE NE $1GW_RECORDER_TYPE
RELATE LOC.PAT 2 NAWDEX# ORDER
OUTPUT %path%/errors APPEND
PRINT 1T,$2NAWDEX_AGCY,'!',$2AGCY_STA_NO,'!',$2STATION_NAME,'!',$2STATE,'!',~
'GW_RECORDER_TYPE','!',GW_RECORDER_TYPE,'!','Invalid code (A,B,BLANK)','!'
RELATE
REM---------------------------------------------------------------------
ASEL
RELATE REC_FREQ.CODES BY GW_RECORDER_FREQ ORDER
RES GW_RECORDER_FREQ NC '9' AND GW_RECORDER_FREQ NE $1GW_RECORDER_FREQ
RELATE LOC.PAT 2 NAWDEX# ORDER
OUTPUT %path%/errors APPEND
PRINT 1T,$2NAWDEX_AGCY,'!',$2AGCY_STA_NO,'!',$2STATION_NAME,'!',$2STATE,'!',~
'GW_RECORDER_FREQ','!',GW_RECORDER_FREQ,'!','Invalid code (A - T, BLANK)','!'
RELATE
REM---------------------------------------------------------------------
ASEL
RELATE PN.CODES BY GW_PN_CODE ORDER
RES GW_PN_CODE NC '9' AND GW_PN_CODE NE $1GW_PN_CODE
RELATE LOC.PAT 2 NAWDEX# ORDER
OUTPUT %path%/errors APPEND
PRINT 1T,$2NAWDEX_AGCY,'!',$2AGCY_STA_NO,'!',$2STATION_NAME,'!',$2STATE,'!',~
'GW_PN_CODE','!',GW_PN_CODE,'!','Invalid code (B,C,D,R,1,2,3,4,BLANK)','!'
RELATE
REM
REM
REM
REM============= CHECKING QW_DATA INFO FILE ==========================================
SEL LOC.PAT
REL QW_DATA QW_KEY LINK
RES $RELREC1 NE 0
RES $1QW_BEGIN_YR LT 1850 OR $1QW_BEGIN_YR GT 1991 AND $1QW_BEGIN_YR NC '9999'
OUTPUT %path%/errors APPEND
PRINT 1T,NAWDEX_AGCY,'!',AGCY_STA_NO,'!',STATION_NAME,'!',STATE,'!',~
'QW_BEGIN_YR','!',$1QW_BEGIN_YR,'!','Invalid date','!'
REM---------------------------------------------------------------------
ASEL
RES $RELREC1 NE 0
RES $1QW_END_YR LT 1850 OR $1QW_END_YR GT 1991 AND $1QW_END_YR NC '9999'
OUTPUT %path%/errors APPEND
PRINT 1T,NAWDEX_AGCY,'!',AGCY_STA_NO,'!',STATION_NAME,'!',STATE,'!',~
'QW_END_YR','!',$1QW_END_YR,'!','Invalid date','!'
REM---------------------------------------------------------------------
ASEL
RES $RELREC1 NE 0
RES $1QW_INTERRUPTED NC 'Y' AND $1QW_INTERRUPTED NC '9'
OUTPUT %path%/errors APPEND
PRINT 1T,NAWDEX_AGCY,'!',AGCY_STA_NO,'!',STATION_NAME,'!',STATE,'!',~
'QW_INTERRUPTED','!',$1QW_INTERRUPTED,'!','Invalid code (Y,BLANK)','!'
REM---------------------------------------------------------------------
ASEL
RES $RELREC1 NE 0
RES $1QW_RECMD_MTHDS NC '9' AND $1QW_RECMD_MTHDS NC 'Y' AND $1QW_RECMD_MTHDS NC 'N'
OUTPUT %path%/errors APPEND
PRINT 1T,NAWDEX_AGCY,'!',AGCY_STA_NO,'!',STATION_NAME,'!',STATE,'!',~
'QW_RECMD_MTHDS','!',$1QW_RECMD_MTHDS,'!','Invalid code (Y,N,BLANK)','!'
REM---------------------------------------------------------------------
```

```
ASEL
RES $RELREC1 NE 0
RES $1QW_LST_UPDATE CN '9999'
OUTPUT %path%/errors APPEND
PRINT 1T,NAWDEX_AGCY,'!',AGCY_STA_NO,'!',STATION_NAME,'!',STATE,'!',~
'QW_LST_UPDATE','!',$1QW_LST_UPDATE,'!','Missing mandatory date','!'
REM--------------------------------------------------------------------------
ASEL
RES $RELREC1 NE 0
RES $1QW_LST_UPDATE NC '9999' AND $1QW_LST_UPDATE LT 1000 OR $1QW_LST_UPDATE GT 9200
OUTPUT %path%/errors APPEND
PRINT 1T,NAWDEX_AGCY,'!',AGCY_STA_NO,'!',STATION_NAME,'!',STATE,'!',~
'QW_LST_UPDATE','!',$1QW_LST_UPDATE,'!','Invalid date','!'
RELATE
REM--------------------------------------------------------------------------
SEL QW_DATA
RELATE TELEMETRY.CODES BY QW_TELEMETRY ORDER
RES QW_TELEMETRY NC '9' AND QW_TELEMETRY NE $1QW_TELEMETRY
RELATE LOC.PAT 2 NAWDEX# ORDER
OUTPUT %path%/errors APPEND
PRINT 1T,$2NAWDEX_AGCY,'!',$2AGCY_STA_NO,'!',$2STATION_NAME,'!',$2STATE,'!',~
'QW_TELEMETRY','!',QW_TELEMETRY,'!','Invalid code (1 - 8)','!'
RELATE
REM--------------------------------------------------------------------------
ASEL
RELATE REC_TYPE.CODES BY QW_RECORDER_TYPE ORDER
RES QW_RECORDER_TYPE NC '9' AND QW_RECORDER_TYPE NE $1QW_RECORDER_TYPE
RELATE LOC.PAT 2 NAWDEX# ORDER
OUTPUT %path%/errors APPEND
PRINT 1T,$2NAWDEX_AGCY,'!',$2AGCY_STA_NO,'!',$2STATION_NAME,'!',$2STATE,'!',~
'QW_RECORDER_TYPE','!',QW_RECORDER_TYPE,'!','Invalid code (A,B,BLANK)','!'
RELATE
REM--------------------------------------------------------------------------
ASEL
RELATE REC_FREQ.CODES BY QW_RECORDER_FREQ ORDER
RES QW_RECORDER_FREQ NC '9' AND QW_RECORDER_FREQ NE $1QW_RECORDER_FREQ
RELATE LOC.PAT 2 NAWDEX# ORDER
OUTPUT %path%/errors APPEND
PRINT 1T,$2NAWDEX_AGCY,'!',$2AGCY_STA_NO,'!',$2STATION_NAME,'!',$2STATE,'!',~
'QW_RECORDER_FREQ','!',QW_RECORDER_FREQ,'!','Invalid code (A - T, BLANK)','!'
RELATE
REM--------------------------------------------------------------------------
ASEL
RELATE PN.CODES BY QW_PN_CODE ORDER
RES QW_PN_CODE NC '9' AND QW_PN_CODE NE $1QW_PN_CODE
RELATE LOC.PAT 2 NAWDEX# ORDER
OUTPUT %path%/errors APPEND
PRINT 1T,$2NAWDEX_AGCY,'!',$2AGCY_STA_NO,'!',$2STATION_NAME,'!',$2STATE,'!',~
'QW_PN_CODE','!',QW_PN_CODE,'!','Invalid code (B,C,D,R,1,2,3,4,BLANK)','!'
RELATE
REM============= CHECKING MET_DATA INFO FILE ========================================
SEL LOC.PAT
RELATE MET_DATA MET_KEY LINK
RES $RELREC1 NE 0
RES $1MET_BEGIN_YR LT 1850 OR $1MET_BEGIN_YR GT 1991 AND $1MET_BEGIN_YR NC '9999'
OUTPUT %path%/errors APPEND
PRINT 1T,NAWDEX_AGCY,'!',AGCY_STA_NO,'!',STATION_NAME,'!',STATE,'!',~
'MET_BEGIN_YR','!',$1MET_BEGIN_YR,'!','Invalid date','!'
REM--------------------------------------------------------------------------
ASEL
RES $RELREC1 NE 0
RES $1MET_END_YR LT 1850 OR $1MET_END_YR GT 1991 AND $1MET_END_YR NC '9999'
OUTPUT %path%/errors APPEND
PRINT 1T,NAWDEX_AGCY,'!',AGCY_STA_NO,'!',STATION_NAME,'!',STATE,'!',~
'MET_END_YR','!',$1MET_END_YR,'!','Invalid date','!'
```

```
REM-------------------------------------------------------------------------
ASEL
RES $RELREC1 NE 0
RES $1MET_INTERRUPTED NC 'Y' AND $1MET_INTERRUPTED NC '9'
OUTPUT %path%/errors APPEND
PRINT 1T,NAWDEX_AGCY,'!',AGCY_STA_NO,'!',STATION_NAME,'!',STATE,'!',~
'MET_INTERRUPTED','!',$1MET_INTERRUPTED,'!','Invalid code (Y,BLANK)','!'
REM-------------------------------------------------------------------------
ASEL
RES $RELREC1 NE 0
RES $1MET_RECMD_MTHDS NC '9' AND $1MET_RECMD_MTHDS NC 'Y' AND $1MET_RECMD_MTHDS NC 'N'
OUTPUT %path%/errors APPEND
PRINT 1T,NAWDEX_AGCY,'!',AGCY_STA_NO,'!',STATION_NAME,'!',STATE,'!',~
'MET_RECMD_MTHDS','!',$1MET_RECMD_MTHDS,'!','Invalid code (Y,N,BLANK)','!'
REM-------------------------------------------------------------------------
ASEL
RES $RELREC1 NE 0
RES $1MET_LST_UPDATE CN '9999'
OUTPUT %path%/errors APPEND
PRINT 1T,NAWDEX_AGCY,'!',AGCY_STA_NO,'!',STATION_NAME,'!',STATE,'!',~
'MET_LST_UPDATE','!',$1MET_LST_UPDATE,'!','Missing mandatory date','!'
REM-------------------------------------------------------------------------
ASEL
RES $RELREC1 NE 0
RES $1MET_LST_UPDATE NC '9999' AND $1MET_LST_UPDATE LT 1000 OR $1MET_LST_UPDATE GT 9200
OUTPUT %path%/errors APPEND
PRINT 1T,NAWDEX_AGCY,'!',AGCY_STA_NO,'!',STATION_NAME,'!',STATE,'!',~
'MET_LST_UPDATE','!',$1MET_LST_UPDATE,'!','Invalid date','!'
RELATE
REM-------------------------------------------------------------------------
SEL MET_DATA
RELATE APPENDIX_A.CODES BY MET_RAINFALL ORDER
RES MET_RAINFALL NC '9' AND MET_RAINFALL NE $1MET_RAINFALL
RELATE LOC.PAT 2 NAWDEX# ORDER
OUTPUT %path%/errors APPEND
PRINT 1T,$2NAWDEX_AGCY,'!',$2AGCY_STA_NO,'!',$2STATION_NAME,'!',$2STATE,'!',~
'MET_RAINFALL','!',MET_RAINFALL,'!','Invalid code (see APPENDIX A,USGS OFR 82-327)','!'
RELATE
REM-------------------------------------------------------------------------
ASEL
RELATE UNIT1.CODES BY MET_UNIT_RAINFAL ORDER
RES MET_UNIT_RAINFAL NC '9' AND MET_UNIT_RAINFAL NE $1MET_UNIT_RAINFAL
RELATE LOC.PAT 2 NAWDEX# ORDER
OUTPUT %path%/errors APPEND
PRINT 1T,$2NAWDEX_AGCY,'!',$2AGCY_STA_NO,'!',$2STATION_NAME,'!',$2STATE,'!',~
'MET_UNIT_RAINFALL','!',MET_UNIT_RAINFAL,'!','Invalid code (A - R, BLANK)','!'
RELATE
REM-------------------------------------------------------------------------
ASEL
RELATE APPENDIX_A.CODES BY MET_AIR_TEMPERAT ORDER
RES MET_AIR_TEMPERAT NC '9' AND MET_AIR_TEMPERAT NE $1MET_AIR_TEMPERAT
RELATE LOC.PAT 2 NAWDEX# ORDER
OUTPUT %path%/errors APPEND
PRINT 1T,$2NAWDEX_AGCY,'!',$2AGCY_STA_NO,'!',$2STATION_NAME,'!',$2STATE,'!',~
'MET_AIR_TEMPERATURE','!',MET_AIR_TEMPERAT,'!','Invalid code (see APPENDIX A,USGS OFR 82-327)','!'
RELATE
REM-------------------------------------------------------------------------
ASEL
RELATE APPENDIX_A.CODES BY MET_WIND_VELOCIT ORDER
RES MET_WIND_VELOCIT NC '9' AND MET_WIND_VELOCIT NE $1MET_WIND_VELOCIT
RELATE LOC.PAT 2 NAWDEX# ORDER
OUTPUT %path%/errors APPEND
PRINT 1T,$2NAWDEX_AGCY,'!',$2AGCY_STA_NO,'!',$2STATION_NAME,'!',$2STATE,'!',~
'MET_WIND_VELOCITY','!',MET_WIND_VELOCIT,'!','Invalid code (see APPENDIX A,USGS OFR 82-327)','!'
RELATE
```

```
REM-------------------------------------------------------------------------
ASEL
RELATE TELEMETRY.CODES BY MET_TELEMETRY ORDER
RES MET_TELEMETRY NC '9' AND MET_TELEMETRY NE $1MET_TELEMETRY
RELATE LOC.PAT 2 NAWDEX# ORDER
OUTPUT %path%/errors APPEND
PRINT 1T,$2NAWDEX_AGCY,'!',$2AGCY_STA_NO,'!',$2STATION_NAME,'!',$2STATE,'!',~
'MET_TELEMETRY','!',MET_TELEMETRY,'!','Invalid code (1 - 8)','!'
RELATE
REM-------------------------------------------------------------------------
ASEL
RELATE APPENDIX_B.CODES BY MET_MEDIA ORDER
RES MET_MEDIA NC '9' AND MET_MEDIA NE $1MET_MEDIA
RELATE LOC.PAT 2 NAWDEX# ORDER
OUTPUT %path%/errors APPEND
PRINT 1T,$2NAWDEX_AGCY,'!',$2AGCY_STA_NO,'!',$2STATION_NAME,'!',$2STATE,'!',~
'MET_MEDIA','!',MET_MEDIA,'!','(see APPENDIX B,USGS OFR 82-327)','!'
RELATE
REM-------------------------------------------------------------------------
ASEL
RELATE REC_TYPE.CODES BY MET_RECORDER_TYP ORDER
RES MET_RECORDER_TYP NC '9' AND MET_RECORDER_TYP NE $1MET_RECORDER_TYP
RELATE LOC.PAT 2 NAWDEX# ORDER
OUTPUT %path%/errors APPEND
PRINT 1T,$2NAWDEX_AGCY,'!',$2AGCY_STA_NO,'!',$2STATION_NAME,'!',$2STATE,'!',~
'MET_RECORDER_TYPE','!',MET_RECORDER_TYP,'!','Invalid code (A,B,BLANK)','!'
RELATE
REM-------------------------------------------------------------------------
ASEL
RELATE REC_FREQ.CODES BY MET_RECORDER_FRE ORDER
RES MET_RECORDER_FRE NC '9' AND MET_RECORDER_FRE NE $1MET_RECORDER_FRE
RELATE LOC.PAT 2 NAWDEX# ORDER
OUTPUT %path%/errors APPEND
PRINT 1T,$2NAWDEX_AGCY,'!',$2AGCY_STA_NO,'!',$2STATION_NAME,'!',$2STATE,'!',~
'MET_RECORDER_FREQ','!',MET_RECORDER_FRE,'!','Invalid code (A - T, BLANK)','!'
RELATE
REM-------------------------------------------------------------------------
ASEL
RELATE PN.CODES BY MET_PN_CODE ORDER
RES MET_PN_CODE NC '9' AND MET_PN_CODE NE $1MET_PN_CODE
RELATE LOC.PAT 2 NAWDEX# ORDER
OUTPUT %path%/errors APPEND
PRINT 1T,$2NAWDEX_AGCY,'!',$2AGCY_STA_NO,'!',$2STATION_NAME,'!',$2STATE,'!',~
'MET_PN_CODE','!',MET_PN_CODE,'!','Invalid code (B,C,D,R,1,2,3,4,BLANK)','!'
RELATE
REM
REM
REM
REM============= CHECKING BIO_DATA INFO FILE ========================================
SEL LOC.PAT
REL BIO_DATA BIO_KEY LINK
RES $RELREC1 NE 0
RES $1BIO_BEGIN_YR LT 1850 OR $1BIO_BEGIN_YR GT 1991 AND $1BIO_BEGIN_YR NC '9999'
OUTPUT %path%/errors APPEND
PRINT 1T,NAWDEX_AGCY,'!',AGCY_STA_NO,'!',STATION_NAME,'!',STATE,'!',~
'BIO_BEGIN_YR','!',$1BIO_BEGIN_YR,'!','Invalid date','!'
REM-------------------------------------------------------------------------
ASEL
RES $RELREC1 NE 0
RES $1BIO_END_YR LT 1850 OR $1BIO_END_YR GT 1991 AND $1BIO_END_YR NC '9999'
OUTPUT %path%/errors APPEND
PRINT 1T,NAWDEX_AGCY,'!',AGCY_STA_NO,'!',STATION_NAME,'!',STATE,'!',~
'BIO_END_YR','!',$1BIO_END_YR,'!','Invalid date','!'
REM-------------------------------------------------------------------------
ASEL
```

```
RES $RELREC1 NE 0
RES $1BIO_RECMD_MTHDS NC '9' AND $1BIO_RECMD_MTHDS NC 'Y' AND $1BIO_RECMD_MTHDS NC 'N'
OUTPUT %path%/errors APPEND
PRINT 1T,NAWDEX_AGCY,'!',AGCY_STA_NO,'!',STATION_NAME,'!',STATE,'!',~
'BIO_RECMD_MTHDS','!',$1BIO_RECMD_MTHDS,'!','Invalid code (Y,N,BLANK)','!'
REM---------------------------------------------------------------------------
ASEL
RES $RELREC1 NE 0
RES $1BIO_LST_UPDATE CN '9999'
OUTPUT %path%/errors APPEND
PRINT 1T,NAWDEX_AGCY,'!',AGCY_STA_NO,'!',STATION_NAME,'!',STATE,'!',~
'BIO_LST_UPDATE','!',$1BIO_LST_UPDATE,'!','Missing mandatory date','!'
REM---------------------------------------------------------------------------
ASEL
RES $RELREC1 NE 0
RES $1BIO_LST_UPDATE NC '9999' AND $1BIO_LST_UPDATE LT 1000 OR $1BIO_LST_UPDATE GT 9200
OUTPUT %path%/errors APPEND
PRINT 1T,NAWDEX_AGCY,'!',AGCY_STA_NO,'!',STATION_NAME,'!',STATE,'!',~
'BIO_LST_UPDATE','!',$1BIO_LST_UPDATE,'!','Invalid date','!'
RELATE
REM---------------------------------------------------------------------------
SEL BIO_DATA
RELATE APPENDIX_A.CODES BY ENTERIC_BACT ORDER
RES ENTERIC_BACT NC '9' AND ENTERIC_BACT NE $1ENTERIC_BACT
RELATE LOC.PAT 2 NAWDEX# ORDER
OUTPUT %path%/errors APPEND
PRINT 1T,$2NAWDEX_AGCY,'!',$2AGCY_STA_NO,'!',$2STATION_NAME,'!',$2STATE,'!',~
'ENTERIC_BACT','!',ENTERIC_BACT,'!','Invalid code (see APPENDIX A,USGS OFR 82-327)','!'
RELATE
REM---------------------------------------------------------------------------
ASEL
RELATE APPENDIX_A.CODES BY NATIVE_BACT ORDER
RES NATIVE_BACT NC '9' AND NATIVE_BACT NE $1NATIVE_BACT
RELATE LOC.PAT 2 NAWDEX# ORDER
OUTPUT %path%/errors APPEND
PRINT 1T,$2NAWDEX_AGCY,'!',$2AGCY_STA_NO,'!',$2STATION_NAME,'!',$2STATE,'!',~
'NATIVE_BACT','!',NATIVE_BACT,'!','Invalid code (see APPENDIX A,USGS OFR 82-327)','!'
RELATE
REM---------------------------------------------------------------------------
ASEL
RELATE APPENDIX_A.CODES BY PHYTOPLANKTON ORDER
RES PHYTOPLANKTON NC '9' AND PHYTOPLANKTON NE $1PHYTOPLANKTON
RELATE LOC.PAT 2 NAWDEX# ORDER
OUTPUT %path%/errors APPEND
PRINT 1T,$2NAWDEX_AGCY,'!',$2AGCY_STA_NO,'!',$2STATION_NAME,'!',$2STATE,'!',~
'PHYTOPLANKTON','!',PHYTOPLANKTON,'!','Invalid code (see APPENDIX A,USGS OFR 82-327)','!'
RELATE
REM---------------------------------------------------------------------------
ASEL
RELATE APPENDIX_A.CODES BY ZOOPLANKTON ORDER
RES ZOOPLANKTON NC '9' AND ZOOPLANKTON NE $1ZOOPLANKTON
RELATE LOC.PAT 2 NAWDEX# ORDER
OUTPUT %path%/errors APPEND
PRINT 1T,$2NAWDEX_AGCY,'!',$2AGCY_STA_NO,'!',$2STATION_NAME,'!',$2STATE,'!',~
'ZOOPLANKTON','!',ZOOPLANKTON,'!','Invalid code (see APPENDIX A,USGS OFR 82-327)','!'
RELATE
REM---------------------------------------------------------------------------
ASEL
RELATE APPENDIX_A.CODES BY PERIPHYTON ORDER
RES PERIPHYTON NC '9' AND PERIPHYTON NE $1PERIPHYTON
RELATE LOC.PAT 2 NAWDEX# ORDER
OUTPUT %path%/errors APPEND
PRINT 1T,$2NAWDEX_AGCY,'!',$2AGCY_STA_NO,'!',$2STATION_NAME,'!',$2STATE,'!',~
'PERIPHYTON','!',PERIPHYTON,'!','Invalid code (see APPENDIX A,USGS OFR 82-327)','!'
RELATE
```

```
REM--------------------------------------------------------------------------
ASEL
RELATE APPENDIX_A.CODES BY MACROPHYTON ORDER
RES MACROPHYTON NC '9' AND MACROPHYTON NE $1MACROPHYTON
RELATE LOC.PAT 2 NAWDEX# ORDER
OUTPUT %path%/errors APPEND
PRINT 1T,$2NAWDEX_AGCY,'!',$2AGCY_STA_NO,'!',$2STATION_NAME,'!',$2STATE,'!',~
'MACROPHYTON','!',MACROPHYTON,'!','Invalid code (see APPENDIX A,USGS OFR 82-327)','!'
RELATE
REM--------------------------------------------------------------------------
ASEL
RELATE APPENDIX_A.CODES BY MICROINVERTS  ORDER
RES MICROINVERTS NC '9' AND MICROINVERTS NE $1MICROINVERTS
RELATE LOC.PAT 2 NAWDEX# ORDER
OUTPUT %path%/errors APPEND
PRINT 1T,$2NAWDEX_AGCY,'!',$2AGCY_STA_NO,'!',$2STATION_NAME,'!',$2STATE,'!',~
'MICROINVERTS','!',MICROINVERTS,'!','Invalid code (see APPENDIX A,USGS OFR 82-327)','!'
RELATE
REM--------------------------------------------------------------------------
ASEL
RELATE APPENDIX_A.CODES BY MACROINVERTS ORDER
RES MACROINVERTS NC '9' AND MACROINVERTS NE $1MACROINVERTS
RELATE LOC.PAT 2 NAWDEX# ORDER
OUTPUT %path%/errors APPEND
PRINT 1T,$2NAWDEX_AGCY,'!',$2AGCY_STA_NO,'!',$2STATION_NAME,'!',$2STATE,'!',~
'MACROINVERTS','!',MACROINVERTS,'!','Invalid code (see APPENDIX A,USGS OFR 82-327)','!'
RELATE
REM--------------------------------------------------------------------------
ASEL
RELATE APPENDIX_A.CODES BY VERTEBRATES ORDER
RES VERTEBRATES NC '9' AND VERTEBRATES NE $1VERTEBRATES
RELATE LOC.PAT 2 NAWDEX# ORDER
OUTPUT %path%/errors APPEND
PRINT 1T,$2NAWDEX_AGCY,'!',$2AGCY_STA_NO,'!',$2STATION_NAME,'!',$2STATE,'!',~
'VERTEBRATES','!',VERTEBRATES,'!','Invalid code (see APPENDIX A,USGS OFR 82-327)','!'
RELATE
REM--------------------------------------------------------------------------
ASEL
RELATE APPENDIX_A.CODES BY FUNGI ORDER
RES FUNGI NC '9' AND FUNGI NE $1FUNGI
RELATE LOC.PAT 2 NAWDEX# ORDER
OUTPUT %path%/errors APPEND
PRINT 1T,$2NAWDEX_AGCY,'!',$2AGCY_STA_NO,'!',$2STATION_NAME,'!',$2STATE,'!',~
'FUNGI','!',FUNGI,'!','Invalid code (see APPENDIX A,USGS OFR 82-327)','!'
RELATE
REM--------------------------------------------------------------------------
ASEL
RELATE APPENDIX_A.CODES BY VIRUSES ORDER
RES VIRUSES NC '9' AND VIRUSES NE $1VIRUSES
RELATE LOC.PAT 2 NAWDEX# ORDER
OUTPUT %path%/errors APPEND
PRINT 1T,$2NAWDEX_AGCY,'!',$2AGCY_STA_NO,'!',$2STATION_NAME,'!',$2STATE,'!',~
'VIRUSES','!',VIRUSES,'!','Invalid code (see APPENDIX A,USGS OFR 82-327)','!'
RELATE
REM--------------------------------------------------------------------------
ASEL
RELATE APPENDIX_A.CODES BY PRIMARY_PRDCTVTY ORDER
RES PRIMARY_PRDCTVTY NC '9' AND PRIMARY_PRDCTVTY NE $1PRIMARY_PRDCTVTY
RELATE LOC.PAT 2 NAWDEX# ORDER
OUTPUT %path%/errors APPEND
PRINT 1T,$2NAWDEX_AGCY,'!',$2AGCY_STA_NO,'!',$2STATION_NAME,'!',$2STATE,'!',~
'PRIMARY_PRDCTVTY','!',PRIMARY_PRDCTVTY,'!','Invalid code (see APPENDIX A,USGS OFR 82-327)','!'
RELATE
REM--------------------------------------------------------------------------
ASEL
```

```
RELATE APPENDIX_A.CODES BY SCENDARY_PRDCTV ORDER
RES SCENDARY_PRDCTV NC '9' AND SCENDARY_PRDCTV NE $1SCENDARY_PRDCTV
RELATE LOC.PAT 2 NAWDEX# ORDER
OUTPUT %path%/errors APPEND
PRINT 1T,$2NAWDEX_AGCY,'!',$2AGCY_STA_NO,'!',$2STATION_NAME,'!',$2STATE,'!',~
'SECONDARY_PRDCTVTY','!',SCENDARY_PRDCTV,'!','Invalid code (see APPENDIX A,USGS OFR 82-327)','!'
RELATE
REM---------------------------------------------------------------------------
ASEL
RELATE APPENDIX_A.CODES BY CHEMOSYNTHETIC_A ORDER
RES CHEMOSYNTHETIC_A NC '9' AND CHEMOSYNTHETIC_A NE $1CHEMOSYNTHETIC_A
RELATE LOC.PAT 2 NAWDEX# ORDER
OUTPUT %path%/errors APPEND
PRINT 1T,$2NAWDEX_AGCY,'!',$2AGCY_STA_NO,'!',$2STATION_NAME,'!',$2STATE,'!',~
'CHEMOSYNTHETIC_ACTIV','!',CHEMOSYNTHETIC_A,'!','Invalid code (see APPENDIX A,USGS OFR 82-
327)','!'
RELATE
REM---------------------------------------------------------------------------
ASEL
RELATE APPENDIX_A.CODES BY BIOSTIMULATORY_T ORDER
RES BIOSTIMULATORY_T NC '9' AND BIOSTIMULATORY_T NE $1BIOSTIMULATORY_T
RELATE LOC.PAT 2 NAWDEX# ORDER
OUTPUT %path%/errors APPEND
PRINT 1T,$2NAWDEX_AGCY,'!',$2AGCY_STA_NO,'!',$2STATION_NAME,'!',$2STATE,'!',~
'BIOSTIMULATORY_TEST','!',BIOSTIMULATORY_T,'!','Invalid code (see APPENDIX A,USGS OFR 82-327)','!'
RELATE
REM---------------------------------------------------------------------------
ASEL
RELATE APPENDIX_A.CODES BY TOXICITY_TEST ORDER
RES TOXICITY_TEST NC '9' AND TOXICITY_TEST NE $1TOXICITY_TEST
RELATE LOC.PAT 2 NAWDEX# ORDER
OUTPUT %path%/errors APPEND
PRINT 1T,$2NAWDEX_AGCY,'!',$2AGCY_STA_NO,'!',$2STATION_NAME,'!',$2STATE,'!',~
'TOXICITY_TEST','!',TOXICITY_TEST,'!','Invalid code (see APPENDIX A,USGS OFR 82-327)','!'
RELATE
REM---------------------------------------------------------------------------
ASEL
RELATE APPENDIX_A.CODES BY OTHER_BIOASSAY_T ORDER
RES OTHER_BIOASSAY_T NC '9' AND OTHER_BIOASSAY_T NE $1OTHER_BIOASSAY_T
RELATE LOC.PAT 2 NAWDEX# ORDER
OUTPUT %path%/errors APPEND
PRINT 1T,$2NAWDEX_AGCY,'!',$2AGCY_STA_NO,'!',$2STATION_NAME,'!',$2STATE,'!',~
'OTHER_BIOASSAY_TEST','!',OTHER_BIOASSAY_T,'!','Invalid code (see APPENDIX A,USGS OFR 82-327)','!'
RELATE
REM---------------------------------------------------------------------------
ASEL
RELATE APPENDIX_A.CODES BY CHM_TISSUE_ANALY ORDER
RES CHM_TISSUE_ANALY NC '9' AND CHM_TISSUE_ANALY NE $1CHM_TISSUE_ANALY
RELATE LOC.PAT 2 NAWDEX# ORDER
OUTPUT %path%/errors APPEND
PRINT 1T,$2NAWDEX_AGCY,'!',$2AGCY_STA_NO,'!',$2STATION_NAME,'!',$2STATE,'!',~
'CHM_TISSUE_ANALYSIS','!',CHM_TISSUE_ANALY,'!','Invalid code (see APPENDIX A,USGS OFR 82-327)','!'
RELATE
REM---------------------------------------------------------------------------
ASEL
RELATE APPENDIX_A.CODES BY HISTOPATH_ANALYS ORDER
RES HISTOPATH_ANALYS NC '9' AND HISTOPATH_ANALYS NE $1HISTOPATH_ANALYS
RELATE LOC.PAT 2 NAWDEX# ORDER
OUTPUT %path%/errors APPEND
PRINT 1T,$2NAWDEX_AGCY,'!',$2AGCY_STA_NO,'!',$2STATION_NAME,'!',$2STATE,'!',~
'HISTOPATH_ANALYSIS','!',HISTOPATH_ANALYS,'!','Invalid code (see APPENDIX A,USGS OFR 82-327)','!'
RELATE
REM---------------------------------------------------------------------------
ASEL
RELATE APPENDIX_A.CODES BY OTHER_TISSUE_ANA ORDER
```

```
RES OTHER_TISSUE_ANA NC '9' AND OTHER_TISSUE_ANA NE $1OTHER_TISSUE_ANA
RELATE LOC.PAT 2 NAWDEX# ORDER
OUTPUT %path%/errors APPEND
PRINT 1T,$2NAWDEX_AGCY,'!',$2AGCY_STA_NO,'!',$2STATION_NAME,'!',$2STATE,'!',~
'OTHER_TISSUE_ANALYS','!',OTHER_TISSUE_ANA,'!','Invalid code (see APPENDIX A,USGS OFR 82-327)','!'
RELATE
REM-----------------------------------------------------------------------
RELATE APPENDIX_B.CODES BY BIOLOGIC_MED ORDER
RES BIOLOGIC_MED NC '9' AND BIOLOGIC_MED NE $1BIOLOGIC_MED
RELATE LOC.PAT 2 NAWDEX# ORDER
OUTPUT %path%/errors APPEND
PRINT 1T,$2NAWDEX_AGCY,'!',$2AGCY_STA_NO,'!',$2STATION_NAME,'!',$2STATE,'!',~
'BIOLOGIC_MED','!',BIOLOGIC_MED,'!','Invalid code (see APPENDIX B,USGS OFR 82-327)','!'
RELATE
REM============= CHECKING PHY_DATA INFO FILE ======================================
SEL LOC.PAT
REL PHY_DATA PHY_KEY LINK
RES $RELREC1 NE 0
RES $1PHY_BEGIN_YR LT 1850 OR $1PHY_BEGIN_YR GT 1991 AND $1PHY_BEGIN_YR NC '9999'
OUTPUT %path%/errors APPEND
PRINT 1T,NAWDEX_AGCY,'!',AGCY_STA_NO,'!',STATION_NAME,'!',STATE,'!',~
'PHY_BEGIN_YR','!',$1PHY_BEGIN_YR,'!','Invalid date','!'
REM-----------------------------------------------------------------------
ASEL
RES $RELREC1 NE 0
RES $1PHY_END_YR LT 1850 OR $1PHY_END_YR GT 1991 AND $1PHY_END_YR NC '9999'
OUTPUT %path%/errors APPEND
PRINT 1T,NAWDEX_AGCY,'!',AGCY_STA_NO,'!',STATION_NAME,'!',STATE,'!',~
'PHY_END_YR','!',$1PHY_END_YR,'!','Invalid date','!'
REM-----------------------------------------------------------------------
ASEL
RES $RELREC1 NE 0
RES $1PHY_RECMD_MTHDS NC '9' AND $1PHY_RECMD_MTHDS NC 'Y' AND $1PHY_RECMD_MTHDS NC 'N'
OUTPUT %path%/errors APPEND
PRINT 1T,NAWDEX_AGCY,'!',AGCY_STA_NO,'!',STATION_NAME,'!',STATE,'!',~
'PHY_RECMD_MTHDS','!',$1PHY_RECMD_MTHDS,'!','Invalid code (Y,N,BLANK)','!'
REM-----------------------------------------------------------------------
ASEL
RES $RELREC1 NE 0
RES $1PPHY_LST_UPDATE CN '9999'
OUTPUT %path%/errors APPEND
PRINT 1T,NAWDEX_AGCY,'!',AGCY_STA_NO,'!',STATION_NAME,'!',STATE,'!',~
'PHY_LST_UPDATE','!',$1PPHY_LST_UPDATE,'!','Missing mandatory date','!'
REM-----------------------------------------------------------------------
ASEL
RES $RELREC1 NE 0
RES $1PPHY_LST_UPDATE NC '9999' AND $1PPHY_LST_UPDATE LT 1000 OR $1PPHY_LST_UPDATE GT 9200
OUTPUT %path%/errors APPEND
PRINT 1T,NAWDEX_AGCY,'!',AGCY_STA_NO,'!',STATION_NAME,'!',STATE,'!',~
'PHY_LST_UPDATE','!',$1PPHY_LST_UPDATE,'!','Invalid date','!'
RELATE
REM-----------------------------------------------------------------------
SEL PHY_DATA
RELATE APPENDIX_A.CODES BY TEMPERATURE ORDER
RES TEMPERATURE NC '9' AND TEMPERATURE NE $1TEMPERATURE
RELATE LOC.PAT 2 NAWDEX# ORDER
OUTPUT %path%/errors APPEND
PRINT 1T,$2NAWDEX_AGCY,'!',$2AGCY_STA_NO,'!',$2STATION_NAME,'!',$2STATE,'!',~
'TEMPERATURE','!',TEMPERATURE,'!','Invalid code (see APPENDIX A,USGS OFR 82-327)','!'
RELATE
REM-----------------------------------------------------------------------
ASEL
RELATE APPENDIX_A.CODES BY SPEC_CONDUCT ORDER
RES SPEC_CONDUCT NC '9' AND SPEC_CONDUCT NE $1SPEC_CONDUCT
RELATE LOC.PAT 2 NAWDEX# ORDER
```

```
OUTPUT %path%/errors APPEND
PRINT 1T,$2NAWDEX_AGCY,'!',$2AGCY_STA_NO,'!',$2STATION_NAME,'!',$2STATE,'!',~
'SPEC_CONDUCT','!',SPEC_CONDUCT,'!','Invalid code (see APPENDIX A,USGS OFR 82-327)','!'
RELATE
REM-----------------------------------------------------------------------
ASEL
RELATE APPENDIX_A.CODES BY TURBIDITY ORDER
RES TURBIDITY NC '9' AND TURBIDITY NE $1TURBIDITY
RELATE LOC.PAT 2 NAWDEX# ORDER
OUTPUT %path%/errors APPEND
PRINT 1T,$2NAWDEX_AGCY,'!',$2AGCY_STA_NO,'!',$2STATION_NAME,'!',$2STATE,'!',~
'TURBIDITY','!',TURBIDITY,'!','Invalid code (see APPENDIX A,USGS OFR 82-327)','!'
RELATE
REM-----------------------------------------------------------------------
ASEL
RELATE APPENDIX_A.CODES BY COLOR ORDER
RES COLOR NC '9' AND COLOR NE $1COLOR
RELATE LOC.PAT 2 NAWDEX# ORDER
OUTPUT %path%/errors APPEND
PRINT 1T,$2NAWDEX_AGCY,'!',$2AGCY_STA_NO,'!',$2STATION_NAME,'!',$2STATE,'!',~
'COLOR','!',COLOR,'!','Invalid code (see APPENDIX A,USGS OFR 82-327)','!'
RELATE
REM-----------------------------------------------------------------------
ASEL
RELATE APPENDIX_A.CODES BY ODOR ORDER
RES ODOR  NC '9' AND ODOR NE $1ODOR
RELATE LOC.PAT 2 NAWDEX# ORDER
OUTPUT %path%/errors APPEND
PRINT 1T,$2NAWDEX_AGCY,'!',$2AGCY_STA_NO,'!',$2STATION_NAME,'!',$2STATE,'!',~
'ODOR','!',ODOR,'!','Invalid code (see APPENDIX A,USGS OFR 82-327)','!'
RELATE
REM-----------------------------------------------------------------------
ASEL
RELATE APPENDIX_A.CODES BY PH ORDER
RES PH NC '9' AND PH NE $1PH
RELATE LOC.PAT 2 NAWDEX# ORDER
OUTPUT %path%/errors APPEND
PRINT 1T,$2NAWDEX_AGCY,'!',$2AGCY_STA_NO,'!',$2STATION_NAME,'!',$2STATE,'!',~
'PH','!',PH,'!','Invalid code (see APPENDIX A,USGS OFR 82-327)','!'
RELATE
REM-----------------------------------------------------------------------
ASEL
RELATE APPENDIX_A.CODES BY SUSPD_SOLIDS ORDER
RES SUSPD_SOLIDS NC '9' AND SUSPD_SOLIDS NE $1SUSPD_SOLIDS
RELATE LOC.PAT 2 NAWDEX# ORDER
OUTPUT %path%/errors APPEND
PRINT 1T,$2NAWDEX_AGCY,'!',$2AGCY_STA_NO,'!',$2STATION_NAME,'!',$2STATE,'!',~
'SUSPD_SOLIDS','!',SUSPD_SOLIDS,'!','Invalid code (see APPENDIX A,USGS OFR 82-327)','!'
RELATE
REM-----------------------------------------------------------------------
ASEL
RELATE APPENDIX_B.CODES BY PHYSICAL_MED ORDER
RES PHYSICAL_MED NC '9' AND PHYSICAL_MED NE $1PHYSICAL_MED
RELATE LOC.PAT 2 NAWDEX# ORDER
OUTPUT %path%/errors APPEND
PRINT 1T,$2NAWDEX_AGCY,'!',$2AGCY_STA_NO,'!',$2STATION_NAME,'!',$2STATE,'!',~
'PHYSICAL_MED','!',PHYSICAL_MED,'!','Invalid code (see APPENDIX B,USGS OFR 82-327)','!'
RELATE
REM
REM
REM
REM============= CHECKING SED_DATA INFO FILE ========================================
SEL LOC.PAT
REL SED_DATA SED_KEY LINK
RES $RELREC1 NE 0
```

```
RES $1SED_BEGIN_YR LT 1850 OR $1SED_BEGIN_YR GT 1991 AND $1SED_BEGIN_YR NC '9999'
OUTPUT %path%/errors APPEND
PRINT 1T,NAWDEX_AGCY,'!',AGCY_STA_NO,'!',STATION_NAME,'!',STATE,'!',~
'SED_BEGIN_YR','!',$1SED_BEGIN_YR,'!','Invalid date','!'
REM---------------------------------------------------------------------------
ASEL
RES $RELREC1 NE 0
RES $1SED_END_YR LT 1850 OR $1SED_END_YR GT 1991 AND $1SED_END_YR NC '9999'
OUTPUT %path%/errors APPEND
PRINT 1T,NAWDEX_AGCY,'!',AGCY_STA_NO,'!',STATION_NAME,'!',STATE,'!',~
'SED_END_YR','!',$1SED_END_YR,'!','Invalid date','!'
REM---------------------------------------------------------------------------
ASEL
RES $RELREC1 NE 0
RES $1SED_RECMD_MTHDS NC '9' AND $1SED_RECMD_MTHDS NC 'Y' AND $1SED_RECMD_MTHDS NC 'N'
OUTPUT %path%/errors APPEND
PRINT 1T,NAWDEX_AGCY,'!',AGCY_STA_NO,'!',STATION_NAME,'!',STATE,'!',~
'SED_RECMD_MTHDS','!',$1SED_RECMD_MTHDS,'!','Invalid code (Y,N,BLANK)','!'
REM---------------------------------------------------------------------------
ASEL
RES $RELREC1 NE 0
RES $1SED_LST_UPDATE CN '9999'
OUTPUT %path%/errors APPEND
PRINT 1T,NAWDEX_AGCY,'!',AGCY_STA_NO,'!',STATION_NAME,'!',STATE,'!',~
'SED_LST_UPDATE','!',$1SED_LST_UPDATE,'!','Missing mandatory date','!'
REM---------------------------------------------------------------------------
ASEL
RES $RELREC1 NE 0
RES $1SED_LST_UPDATE NC '9999' AND $1SED_LST_UPDATE LT 1000 OR $1SED_LST_UPDATE GT 9200
OUTPUT %path%/errors APPEND
PRINT 1T,NAWDEX_AGCY,'!',AGCY_STA_NO,'!',STATION_NAME,'!',STATE,'!',~
'SED_LST_UPDATE','!',$1SED_LST_UPDATE,'!','Invalid date','!'
RELATE
REM---------------------------------------------------------------------------
SEL SED_DATA
RELATE APPENDIX_A.CODES BY BED_LOAD ORDER
RES BED_LOAD NC '9' AND BED_LOAD NE $1BED_LOAD
RELATE LOC.PAT 2 NAWDEX# ORDER
OUTPUT %path%/errors APPEND
PRINT 1T,$2NAWDEX_AGCY,'!',$2AGCY_STA_NO,'!',$2STATION_NAME,'!',$2STATE,'!',~
'BED_LOAD','!',BED_LOAD,'!','Invalid code (see APPENDIX A,USGS OFR 82-327)','!'
RELATE
REM---------------------------------------------------------------------------
ASEL
RELATE APPENDIX_A.CODES BY CNCNTRIN_SUS ORDER
RES CNCNTRIN_SUS NC '9' AND CNCNTRIN_SUS NE $1CNCNTRIN_SUS
RELATE LOC.PAT 2 NAWDEX# ORDER
OUTPUT %path%/errors APPEND
PRINT 1T,$2NAWDEX_AGCY,'!',$2AGCY_STA_NO,'!',$2STATION_NAME,'!',$2STATE,'!',~
'CNCNTRTN_SUS','!',CNCNTRIN_SUS,'!','Invalid code (see APPENDIX A,USGS OFR 82-327)','!'
RELATE
REM---------------------------------------------------------------------------
ASEL
RELATE APPENDIX_A.CODES BY CNCNTRIN_TOT ORDER
RES CNCNTRIN_TOT NC '9' AND CNCNTRIN_TOT NE $1CNCNTRIN_TOT
RELATE LOC.PAT 2 NAWDEX# ORDER
OUTPUT %path%/errors APPEND
PRINT 1T,$2NAWDEX_AGCY,'!',$2AGCY_STA_NO,'!',$2STATION_NAME,'!',$2STATE,'!',~
'CNCNTRTN_TOT','!',CNCNTRIN_TOT,'!','Invalid code (see APPENDIX A,USGS OFR 82-327)','!'
RELATE
REM---------------------------------------------------------------------------
ASEL
RELATE APPENDIX_A.CODES BY PART_SIZ_SUS ORDER
RES PART_SIZ_SUS NC '9' AND PART_SIZ_SUS NE $1PART_SIZ_SUS
RELATE LOC.PAT 2 NAWDEX# ORDER
```

```
OUTPUT %path%/errors APPEND
PRINT 1T,$2NAWDEX_AGCY,'!',$2AGCY_STA_NO,'!',$2STATION_NAME,'!',$2STATE,'!',~
'PART_SIZ_SUS','!',PART_SIZ_SUS,'!','Invalid code (see APPENDIX A,USGS OFR 82-327)','!'
RELATE
REM---------------------------------------------------------------------------
ASEL
RELATE APPENDIX_A.CODES BY PART_SIZ_BED ORDER
RES PART_SIZ_BED NC '9' AND PART_SIZ_BED NE $1PART_SIZ_BED
RELATE LOC.PAT 2 NAWDEX# ORDER
OUTPUT %path%/errors APPEND
PRINT 1T,$2NAWDEX_AGCY,'!',$2AGCY_STA_NO,'!',$2STATION_NAME,'!',$2STATE,'!',~
'PART_SIZ_BED','!',PART_SIZ_BED,'!','Invalid code (see APPENDIX A,USGS OFR 82-327)','!'
RELATE
REM---------------------------------------------------------------------------
ASEL
RELATE APPENDIX_A.CODES BY SED_DIS_SUS ORDER
RES SED_DIS_SUS NC '9' AND SED_DIS_SUS NE $1SED_DIS_SUS
RELATE LOC.PAT 2 NAWDEX# ORDER
OUTPUT %path%/errors APPEND
PRINT 1T,$2NAWDEX_AGCY,'!',$2AGCY_STA_NO,'!',$2STATION_NAME,'!',$2STATE,'!',~
'SED_DIS_SUS','!',SED_DIS_SUS,'!','Invalid code (see APPENDIX A,USGS OFR 82-327)','!'
RELATE
REM---------------------------------------------------------------------------
ASEL
RELATE APPENDIX_A.CODES BY SED_DIS_TOT ORDER
RES SED_DIS_TOT NC '9' AND SED_DIS_TOT NE $1SED_DIS_TOT
RELATE LOC.PAT 2 NAWDEX# ORDER
OUTPUT %path%/errors APPEND
PRINT 1T,$2NAWDEX_AGCY,'!',$2AGCY_STA_NO,'!',$2STATION_NAME,'!',$2STATE,'!',~
'SED_DIS_TOT','!',SED_DIS_TOT,'!','Invalid code (see APPENDIX A,USGS OFR 82-327)','!'
RELATE
REM---------------------------------------------------------------------------
ASEL
RELATE APPENDIX_B.CODES BY SEDIMENT_MED ORDER
RES SEDIMENT_MED NC '9' AND SEDIMENT_MED NE $1SEDIMENT_MED
RELATE LOC.PAT 2 NAWDEX# ORDER
OUTPUT %path%/errors APPEND
PRINT 1T,$2NAWDEX_AGCY,'!',$2AGCY_STA_NO,'!',$2STATION_NAME,'!',$2STATE,'!',~
'SEDIMENT_MED','!',SEDIMENT_MED,'!','Invalid code (see APPENDIX B,USGS OFR 82-327)','!'
RELATE
REM
REM
REM
REM============= CHECKING CHM_DATA INFO FILE ========================================
SEL LOC.PAT
REL CHM_DATA CHM_KEY LINK
RES $RELREC1 NE 0
RES $1CHM_BEGIN_YR LT 1850 OR $1CHM_BEGIN_YR GT 1991 AND $1CHM_BEGIN_YR NC '9999'
OUTPUT %path%/errors APPEND
PRINT 1T,NAWDEX_AGCY,'!',AGCY_STA_NO,'!',STATION_NAME,'!',STATE,'!',~
'CHM_BEGIN_YR','!',$1CHM_BEGIN_YR,'!','Invalid date','!'
REM---------------------------------------------------------------------------
ASEL
RES $RELREC1 NE 0
RES $1CHM_END_YR LT 1850 OR $1CHM_END_YR GT 1991 AND $1CHM_END_YR NC '9999'
OUTPUT %path%/errors APPEND
PRINT 1T,NAWDEX_AGCY,'!',AGCY_STA_NO,'!',STATION_NAME,'!',STATE,'!',~
'CHM_END_YR','!',$1CHM_END_YR,'!','Invalid date','!'
REM---------------------------------------------------------------------------
ASEL
RES $RELREC1 NE 0
RES $1CHEM_RECMD_MTHDS NC '9' AND $1CHEM_RECMD_MTHDS NC 'Y' AND $1CHEM_RECMD_MTHDS NC 'N'
OUTPUT %path%/errors APPEND
PRINT 1T,NAWDEX_AGCY,'!',AGCY_STA_NO,'!',STATION_NAME,'!',STATE,'!',~
'CHM_RECMD_MTHDS','!',$1CHEM_RECMD_MTHDS,'!','Invalid code (Y,N,BLANK)','!'
```

```
REM--------------------------------------------------------------------------
ASEL
RES $RELREC1 NE 0
RES $1CHM_LST_UPDATE CN '9999'
OUTPUT %path%/errors APPEND
PRINT 1T,NAWDEX_AGCY,'!',AGCY_STA_NO,'!',STATION_NAME,'!',STATE,'!',~
'CHM_LST_UPDATE','!',$1CHM_LST_UPDATE,'!','Missing mandatory date','!'
REM--------------------------------------------------------------------------
ASEL
RES $RELREC1 NE 0
RES $1CHM_LST_UPDATE NC '9999' AND $1CHM_LST_UPDATE LT 1000 OR $1CHM_LST_UPDATE GT 9200
OUTPUT %path%/errors APPEND
PRINT 1T,NAWDEX_AGCY,'!',AGCY_STA_NO,'!',STATION_NAME,'!',STATE,'!',~
'CHM_LST_UPDATE','!',$1CHM_LST_UPDATE,'!','Invalid date','!'
RELATE
REM--------------------------------------------------------------------------
SEL CHM_DATA
RELATE APPENDIX_A.CODES BY SOLIDS_DIS ORDER
RES SOLIDS_DIS NC '9' AND SOLIDS_DIS NE $1SOLIDS_DIS
RELATE LOC.PAT 2 NAWDEX# ORDER
OUTPUT %path%/errors APPEND
PRINT 1T,$2NAWDEX_AGCY,'!',$2AGCY_STA_NO,'!',$2STATION_NAME,'!',$2STATE,'!',~
'SOLIDS_DIS','!',SOLIDS_DIS,'!','Invalid code (see APPENDIX A,USGS OFR 82-327)','!'
RELATE
REM--------------------------------------------------------------------------
ASEL
RELATE APPENDIX_A.CODES BY MAJOR_IONS ORDER
RES MAJOR_IONS NC '9' AND MAJOR_IONS NE $1MAJOR_IONS
RELATE LOC.PAT 2 NAWDEX# ORDER
OUTPUT %path%/errors APPEND
PRINT 1T,$2NAWDEX_AGCY,'!',$2AGCY_STA_NO,'!',$2STATION_NAME,'!',$2STATE,'!',~
'MAJOR_IONS','!',MAJOR_IONS,'!','Invalid code (see APPENDIX A,USGS OFR 82-327)','!'
RELATE
REM--------------------------------------------------------------------------
ASEL
RELATE APPENDIX_A.CODES BY HARDNESS ORDER
RES HARDNESS NC '9' AND HARDNESS NE $1HARDNESS
RELATE LOC.PAT 2 NAWDEX# ORDER
OUTPUT %path%/errors APPEND
PRINT 1T,$2NAWDEX_AGCY,'!',$2AGCY_STA_NO,'!',$2STATION_NAME,'!',$2STATE,'!',~
'HARDNESS','!',HARDNESS,'!','Invalid code (see APPENDIX A,USGS OFR 82-327)','!'
RELATE
REM--------------------------------------------------------------------------
ASEL
RELATE APPENDIX_A.CODES BY SILICA ORDER
RES SILICA NC '9' AND SILICA NE $1SILICA
RELATE LOC.PAT 2 NAWDEX# ORDER
OUTPUT %path%/errors APPEND
PRINT 1T,$2NAWDEX_AGCY,'!',$2AGCY_STA_NO,'!',$2STATION_NAME,'!',$2STATE,'!',~
'SILICA','!',SILICA,'!','Invalid code (see APPENDIX A,USGS OFR 82-327)','!'
RELATE
REM--------------------------------------------------------------------------
ASEL
RELATE APPENDIX_A.CODES BY PHOSPHORUS ORDER
RES PHOSPHORUS NC '9' AND PHOSPHORUS NE $1PHOSPHORUS
RELATE LOC.PAT 2 NAWDEX# ORDER
OUTPUT %path%/errors APPEND
PRINT 1T,$2NAWDEX_AGCY,'!',$2AGCY_STA_NO,'!',$2STATION_NAME,'!',$2STATE,'!',~
'PHOSPHORUS','!',PHOSPHORUS,'!','Invalid code (see APPENDIX A,USGS OFR 82-327)','!'
RELATE
REM--------------------------------------------------------------------------
ASEL
RELATE APPENDIX_A.CODES BY PHOS_SPECIES ORDER
RES PHOS_SPECIES NC '9' AND PHOS_SPECIES NE $1PHOS_SPECIES
RELATE LOC.PAT 2 NAWDEX# ORDER
```

```
OUTPUT %path%/errors APPEND
PRINT 1T,$2NAWDEX_AGCY,'!',$2AGCY_STA_NO,'!',$2STATION_NAME,'!',$2STATE,'!',~
'PHOS_SPECIES','!',PHOS_SPECIES,'!','Invalid code (see APPENDIX A,USGS OFR 82-327)','!'
RELATE
REM---------------------------------------------------------------------------
ASEL
RELATE APPENDIX_A.CODES BY NITROGEN ORDER
RES NITROGEN NC '9' AND NITROGEN NE $1NITROGEN
RELATE LOC.PAT 2 NAWDEX# ORDER
OUTPUT %path%/errors APPEND
PRINT 1T,$2NAWDEX_AGCY,'!',$2AGCY_STA_NO,'!',$2STATION_NAME,'!',$2STATE,'!',~
'NITROGEN','!',NITROGEN,'!','Invalid code (see APPENDIX A,USGS OFR 82-327)','!'
RELATE
REM---------------------------------------------------------------------------
ASEL
RELATE APPENDIX_A.CODES BY N_SPECIES ORDER
RES N_SPECIES NC '9' AND N_SPECIES NE $1N_SPECIES
RELATE LOC.PAT 2 NAWDEX# ORDER
OUTPUT %path%/errors APPEND
PRINT 1T,$2NAWDEX_AGCY,'!',$2AGCY_STA_NO,'!',$2STATION_NAME,'!',$2STATE,'!',~
'N_SPECIES','!',N_SPECIES,'!','Invalid code (see APPENDIX A,USGS OFR 82-327)','!'
RELATE
REM---------------------------------------------------------------------------
ASEL
RELATE APPENDIX_A.CODES BY DETERGENTS ORDER
RES DETERGENTS NC '9' AND DETERGENTS NE $1DETERGENTS
RELATE LOC.PAT 2 NAWDEX# ORDER
OUTPUT %path%/errors APPEND
PRINT 1T,$2NAWDEX_AGCY,'!',$2AGCY_STA_NO,'!',$2STATION_NAME,'!',$2STATE,'!',~
'DETERGENTS','!',DETERGENTS,'!','Invalid code (see APPENDIX A,USGS OFR 82-327)','!'
RELATE
REM---------------------------------------------------------------------------
ASEL
RELATE APPENDIX_A.CODES BY OMI_CONSTITS ORDER
RES OMI_CONSTITS NC '9' AND OMI_CONSTITS NE $1OMI_CONSTITS
RELATE LOC.PAT 2 NAWDEX# ORDER
OUTPUT %path%/errors APPEND
PRINT 1T,$2NAWDEX_AGCY,'!',$2AGCY_STA_NO,'!',$2STATION_NAME,'!',$2STATE,'!',~
'OMI_CONSTITS','!',OMI_CONSTITS,'!','Invalid code (see APPENDIX A,USGS OFR 82-327)','!'
RELATE
REM---------------------------------------------------------------------------
ASEL
RELATE APPENDIX_A.CODES BY RADIOACTIVITY ORDER
RES RADIOACTIVITY NC '9' AND RADIOACTIVITY NE $1RADIOACTIVITY
RELATE LOC.PAT 2 NAWDEX# ORDER
OUTPUT %path%/errors APPEND
PRINT 1T,$2NAWDEX_AGCY,'!',$2AGCY_STA_NO,'!',$2STATION_NAME,'!',$2STATE,'!',~
'RADIOACTIVITY','!',RADIOACTIVITY,'!','Invalid code (see APPENDIX A,USGS OFR 82-327)','!'
RELATE
REM---------------------------------------------------------------------------
ASEL
RELATE APPENDIX_A.CODES BY RCHM_SPECIES ORDER
RES RCHM_SPECIES NC '9' AND RCHM_SPECIES NE $1RCHM_SPECIES
RELATE LOC.PAT 2 NAWDEX# ORDER
OUTPUT %path%/errors APPEND
PRINT 1T,$2NAWDEX_AGCY,'!',$2AGCY_STA_NO,'!',$2STATION_NAME,'!',$2STATE,'!',~
'RCHM_SPECIES','!',RCHM_SPECIES,'!','Invalid code (see APPENDIX A,USGS OFR 82-327)','!'
RELATE
REM---------------------------------------------------------------------------
ASEL
RELATE APPENDIX_A.CODES BY CARBON ORDER
RES CARBON NC '9' AND CARBON NE $1CARBON
RELATE LOC.PAT 2 NAWDEX# ORDER
OUTPUT %path%/errors APPEND
PRINT 1T,$2NAWDEX_AGCY,'!',$2AGCY_STA_NO,'!',$2STATION_NAME,'!',$2STATE,'!',~
```

```
'CARBON','!',CARBON,'!','Invalid code (see APPENDIX A,USGS OFR 82-327)','!'
RELATE
REM-----------------------------------------------------------------------
ASEL
RELATE APPENDIX_A.CODES BY ORG_GROUPS ORDER
RES ORG_GROUPS NC '9' AND ORG_GROUPS NE $1ORG_GROUPS
RELATE LOC.PAT 2 NAWDEX# ORDER
OUTPUT %path%/errors APPEND
PRINT 1T,$2NAWDEX_AGCY,'!',$2AGCY_STA_NO,'!',$2STATION_NAME,'!',$2STATE,'!',~
'ORG_GROUPS','!',ORG_GROUPS,'!','Invalid code (see APPENDIX A,USGS OFR 82-327)','!'
RELATE
REM-----------------------------------------------------------------------
ASEL
RELATE APPENDIX_A.CODES BY PEST_SPECIES ORDER
RES PEST_SPECIES NC '9' AND PEST_SPECIES NE $1PEST_SPECIES
RELATE LOC.PAT 2 NAWDEX# ORDER
OUTPUT %path%/errors APPEND
PRINT 1T,$2NAWDEX_AGCY,'!',$2AGCY_STA_NO,'!',$2STATION_NAME,'!',$2STATE,'!',~
'PEST_SPECIES','!',PEST_SPECIES,'!','Invalid code (see APPENDIX A,USGS OFR 82-327)','!'
RELATE
REM-----------------------------------------------------------------------
ASEL
RELATE APPENDIX_A.CODES BY OTH_ORG_SPECIES ORDER
RES OTH_ORG_SPECIES NC '9' AND OTH_ORG_SPECIES NE $1OTH_ORG_SPECIES
RELATE LOC.PAT 2 NAWDEX# ORDER
OUTPUT %path%/errors APPEND
PRINT 1T,$2NAWDEX_AGCY,'!',$2AGCY_STA_NO,'!',$2STATION_NAME,'!',$2STATE,'!',~
'OTH_ORG_SPECIES','!',OTH_ORG_SPECIES,'!','Invalid code (see APPENDIX A,USGS OFR 82-327)','!'
RELATE
REM-----------------------------------------------------------------------
ASEL
RELATE APPENDIX_A.CODES BY BIOCHEM_OX_DMND ORDER
RES BIOCHEM_OX_DMND NC '9' AND BIOCHEM_OX_DMND NE $1BIOCHEM_OX_DMND
RELATE LOC.PAT 2 NAWDEX# ORDER
OUTPUT %path%/errors APPEND
PRINT 1T,$2NAWDEX_AGCY,'!',$2AGCY_STA_NO,'!',$2STATION_NAME,'!',$2STATE,'!',~
'BIOCHM_OX_DMND','!',BIOCHEM_OX_DMND,'!','Invalid code (see APPENDIX A,USGS OFR 82-327)','!'
RELATE
REM-----------------------------------------------------------------------
ASEL
RELATE APPENDIX_A.CODES BY CHEM_OX_DMND ORDER
RES CHEM_OX_DMND NC '9' AND CHEM_OX_DMND NE $1CHEM_OX_DMND
RELATE LOC.PAT 2 NAWDEX# ORDER
OUTPUT %path%/errors APPEND
PRINT 1T,$2NAWDEX_AGCY,'!',$2AGCY_STA_NO,'!',$2STATION_NAME,'!',$2STATE,'!',~
'CHM_OX_DMND','!',CHEM_OX_DMND,'!','Invalid code (see APPENDIX A,USGS OFR 82-327)','!'
RELATE
REM-----------------------------------------------------------------------
ASEL
RELATE APPENDIX_A.CODES BY DISSOLVED_OX ORDER
RES DISSOLVED_OX NC '9' AND DISSOLVED_OX NE $1DISSOLVED_OX
RELATE LOC.PAT 2 NAWDEX# ORDER
OUTPUT %path%/errors APPEND
PRINT 1T,$2NAWDEX_AGCY,'!',$2AGCY_STA_NO,'!',$2STATION_NAME,'!',$2STATE,'!',~
'DISSOLVED_OX','!',DISSOLVED_OX,'!','Invalid code (see APPENDIX A,USGS OFR 82-327)','!'
RELATE
REM-----------------------------------------------------------------------
ASEL
RELATE APPENDIX_A.CODES BY OTHER_DIS_GAS ORDER
RES OTHER_DIS_GAS NC '9' AND OTHER_DIS_GAS NE $1OTHER_DIS_GAS
RELATE LOC.PAT 2 NAWDEX# ORDER
OUTPUT %path%/errors APPEND
PRINT 1T,$2NAWDEX_AGCY,'!',$2AGCY_STA_NO,'!',$2STATION_NAME,'!',$2STATE,'!',~
'OTHER_DIS_GAS','!',OTHER_DIS_GAS,'!','Invalid code (see APPENDIX A,USGS OFR 82-327)','!'
RELATE
```

```
REM--------------------------------------------------------------------------
ASEL
RELATE APPENDIX_B.CODES BY CHEMICAL_MED ORDER
RES CHEMICAL_MED NC '9' AND CHEMICAL_MED NE $1CHEMICAL_MED
RELATE LOC.PAT 2 NAWDEX# ORDER
OUTPUT %path%/errors APPEND
PRINT 1T,$2NAWDEX_AGCY,'!',$2AGCY_STA_NO,'!',$2STATION_NAME,'!',$2STATE,'!',~
'CHEMICAL_MED','!',CHEMICAL_MED,'!','Invalid code (see APPENDIX B,USGS OFR 82-327)','!'
RELATE
Q STOP
&end
/*
&type
&type
&type //////////////////////////
&type
&type   NONGEO.AML complete ...
&type
&type //////////////////////////
&type
&type
/*
&return
/*
/*
&routine get_out
&type
&type ***************  FAILURE ************************
&type
&type             NONGEO.AML has failed
&type   See CHK file in state directory for details
&type
&type ************************************************
&type
&workspace %.home%
&s cerr [close -all]
quit       /* exit arc
&stop
```

```
/*-----------------------------------------------------------------------
/*
/*  Command name:           MIS_DUP.AML
/*  Version:                1.0
/*  Language:               Arc Macro Language
/*  Arc Version/Platform:   6.0 / DGUX
/*  Subsystem:              Arc
/*
/*:::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::
/*
/*  Purpose: To identify MWDI sites which are missing geographic
/*           coordinates or sites which share same coordinates.
/*           It produces the following outputs:
/*
/*    1. ADMIN.RPT3 (frequency of duplicate LAT/LONG by state)
/*    2. ADMIN.RPT4 (frequency of duplicate LAT/LONG by agency for state)
/*    3. ADMIN.RPT5 (frequency of missing LAT/LONG by state)
/*    4. ADMIN.RPT6 (frequency of missing LAT/LONG by agency for state)
/*    5. DUPS.<agency> (agency duplicate LAT/LONG report)
/*    6. MISSING.<agency> (agency missing LAT/LONG report)
/*
/*:::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::
/*
/*  Arguments: None
/*
/*:::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::
/*
/*  Programs or menus called: Called by DRIVER.AML
/*
/*:::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::
/*
/*  History:
/*
/*  Author/Site           Date     Version   Event
/*  ------------------------------------------------------------------
/*  Harrison/USGS-OR      9-91     1.0       Original coding
/*
/*:::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::
/*
/* Disclaimer:
/*  Although this program has been used by the U.S. Geological Survey, no
/*  warranty, expressed or implied, is made by the USGS as to the accuracy
/*  or functioning of the program.  No responsibility is assumed by the
/*  USGS in connection with this program's distribution or use.
/*
/*-----------------------------------------------------------------------
/*
&severity &error &routine get_out
&type
&type ================================================
&type
&type MIS_DUP.AML :  Version 1.0  :  [date -full]
&type
&type ================================================
&type
/*
&s path [dir [pathname workspace]]
/*
/* clean up
```

```
/*
&if [exists duplicates.rpt -file] &then &sys rm duplicates.rpt
&if [exists duplicates.wpn -info] &then infodelete duplicates.wpn
&if [exists dups.rpt -info] &then infodelete dups.rpt
&if [exists missing.rpt -info] &then infodelete missing.rpt
/*
&if [exists coords -info] &then infodelete coords
&if [exists coords.2 -info] &then infodelete coords.2
&if [exists dup_agcy -info] &then infodelete dup_agcy
&if [exists missing_agcy -info] &then infodelete missing_agcy
&if [exists dups.usgs -file] &then rm dups*
/*
&if [exists admin.rpt3 -file] &then &sys rm admin.rpt3
&if [exists admin.rpt4 -file] &then &sys rm admin.rpt4
&if [exists admin.rpt5 -file] &then &sys rm admin.rpt5
&if [exists admin.rpt6 -file] &then &sys rm admin.rpt6
/*
&if [exists admin.rpt3 -info] &then infodelete admin.rpt3
&if [exists admin.rpt4 -info] &then infodelete admin.rpt4
&if [exists admin.rpt5 -info] &then infodelete admin.rpt5
&if [exists admin.rpt6 -info] &then infodelete admin.rpt6
/*
&if [exists report5 -info] &then infodelete report5
&if [exists report6 -info] &then infodelete report6
&if [exists report7 -info] &then infodelete report7
&if [exists report8 -info] &then infodelete report8
/*
&if [exists state_dups.pg -info] &then infodelete state_dups.pg
&if [exists agcy_dups.pg -info] &then infodelete agcy_dups.pg
&if [exists agcy_missing.pg -info] &then infodelete agcy_missing.pg
/*
&DATA ARC INFO
ARC
CA $NM = 1
CA $PRINTER-SIZE = 200
DELIM ,
REM -------------------------CREATING LAT/LONG
REM ------------------------COORDINATE INFO FILE
DEFINE COORDS
LONGLAT,30,C
FLAG1,1,I
FLAG2,3,C
FLAG3,1,I
FLAG4,3,C
RECNO,5,I
NAWDEX_AGCY,5,C
AGCY_STA_NO,15,C
STATION_NAME,48,C
[UNQUOTE ' ']
ADD FROM %path%/crd_data
RELATE LOC.PAT $RECNO LINK
MOVE $1NAWDEX_AGCY TO NAWDEX_AGCY
MOVE $1AGCY_STA_NO TO AGCY_STA_NO
MOVE $1STATION_NAME TO STATION_NAME
RELATE
REM ------------------------LOCATING SITES WITH DUPLICATE
REM -------------------------LAT/LONG FOR ENTIRE STATE
CA RECNO = $RECNO
PROGRAM STATE_DUPS.PG
```

```
FORMAT $CHR1,30,30,C
SORT LONGLAT (D)
CA FLAG1 = 0
MOVE '                          ' TO $CHR1
PROG 2
IF $CHR1 EQ LONGLAT
CA FLAG1 = 1
ENDIF
MOVE LONGLAT TO $CHR1
PROG 3
MOVE '                          ' TO $CHR1
SORT $RECNO (D)
PROG 4
IF $CHR1 EQ LONGLAT
CA FLAG1 = 1
ENDIF
MOVE LONGLAT TO $CHR1
PROG 5
ASEL
SORT ON RECNO
END

RUN STATE_DUPS.PG
ERASE STATE_DUPS.PG
Y
SEL COORDS
RES FLAG1 = 1
MOVE 'YES' TO FLAG2
ASEL
RES FLAG1 = 0
MOVE 'NO' TO FLAG2
REM ------------------------LOCATING SITES MISSING LAT/LONG
REM ----------------------------FOR ENTIRE STATE
ASEL
RES LONGLAT CN '
CA FLAG3 = 1
MOVE 'YES' TO FLAG4
ASEL
RES FLAG3 = 0
MOVE 'NO' TO FLAG4
REM
REM ------------------------CREATING INFO FILE OF AGENCIES
REM ----------------------------WITH DUPLICATE LAT/LONG
DEFINE DUP_AGCY
NAWDEX_AGCY,5,C
[UNQUOTE ' ']
SEL COORDS
RES FLAG1 = 1
RES FLAG3 = 0
RELATE DUP_AGCY NAWDEX_AGCY FILL
MOVE NAWDEX_AGCY TO $1NAWDEX_AGCY
RELATE
REM -------------------------------CREATING INFO FILE OF
REM ----------------------------AGENCIES WITH MISSING LAT/LONG
DEFINE MISSING_AGCY
NAWDEX_AGCY,5,C
[UNQUOTE ' ']
SEL COORDS
RES FLAG3 = 1
```

```
RELATE MISSING_AGCY NAWDEX_AGCY FILL
MOVE NAWDEX_AGCY TO $1NAWDEX_AGCY
RELATE
REM -------------------------------DEFINE INFO REPORT
REM -----------------------------FOR DUPLICATE LAT/LONG
ASEL
REPORT DUPS.RPT LONG
3
1
200
8X
NAWDEX_AGCY
8
AGENCY
LONGLAT
B
LONG./LAT.
AGCY_STA_NO
[UNQUOTE ' ']
SITE ID
STATION_NAME
[UNQUOTE ' ']
STATION NAME
[UNQUOTE ' ']
'NAWDEX SITES CONTAINING IDENTICAL LAT/LONG'
'FOR THE AGENCY ',$CHR5
'IN STATE OF ',$CHR4
N
REM -------------------------------DEFINE INFO REPORT
REM -----------------------------FOR MISSING LAT/LONG
SEL COORDS
REPORT MISSING.RPT LONG
3
1
200
8X
AGCY_STA_NO
[UNQUOTE ' ']
SITE ID
10X
STATION_NAME
[UNQUOTE ' ']
STATION NAME
[UNQUOTE ' ']
'NAWDEX SITES MISSING LAT/LONG'
'FOR THE AGENCY ',$CHR5
'IN STATE OF ',$CHR4
N
REM --------------------------------LOCATING ALL SITES WITH
REM -----------------------------DUPLICATE LAT/LONG BY AGENCY
DEF COORDS.2
LONGLAT,30,C
[UNQUOTE ' ']
FO $NUM2,2,I
FO $NUM3,2,I
FO $CHR4,2,C
FO $CHR5,5,C
FO $CHR6,17,C
SEL DUP_AGCY
```

```
CA $NUM2 = $NOREC
RES $RECNO = 1
CA $NUM3 = 1
MOVE [QUOTE %.state%] TO $CHR4
MOVE [QUOTE %path%] TO $CHR6
DISPLAY $CHR6
ASEL
REM
SEL COORDS
SORT ON LONGLAT
REM
PROGRAM AGCY_DUPS.PG
LABEL AGAIN
SEL DUP_AGCY
RES BY $RECNO = $NUM3
MOVE NAWDEX_AGCY TO $CHR5
DISPLAY 'COUNT IS  ',$NUM3,'  OUT OF  ',$NUM2,'  RECORDS ...'
DISPLAY 'LOCATING DUPLICATE LAT/LONG FOR AGENCY   ',$CHR5
CA $NUM3 = $NUM3 + 1
SEL COORDS.2
PURGE Y
SEL COORDS
RES FLAG1 = 1
RES NAWDEX_AGCY CN $CHR5
RELATE COORDS.2 BY LONGLAT APPEND
MOVE LONGLAT TO $1LONGLAT
SEL COORDS.2
MOVE LONGLAT TO LONGLAT
SORT ON LONGLAT
SEL COORDS
RES FLAG1 = 1
RES FLAG3 = 0
RELATE COORDS.2 BY LONGLAT ORDER
CA $NM = 1
RES LONGLAT = $1LONGLAT
FO $CHR9,40,C
CONCAT $CHR9 FROM 'OUTPUT ',$CHR6,'/dups.',$CHR5,' INIT'
DISPLAY $CHR9
DISPLAY '   '
EXEC $CHR9
REPORT DUPS.RPT Y 75
IF $NUM3 GT $NUM2
END
ELSE
GOTO AGAIN
ENDIF

RUN AGCY_DUPS.PG
ERASE AGCY_DUPS.PG
Y
REM ----------------------------LOCATING ALL SITES
REM -------------------------MISSING LAT/LONG BY AGENCY
FO $NUM2,2,I
FO $NUM3,2,I
FO $CHR4,2,C
FO $CHR5,5,C
FO $CHR6,17,C
SEL MISSING_AGCY
CA $NUM2 = $NOREC
```

```
RES $RECNO = 1
CA $NUM3 = 1
MOVE [QUOTE %.state%] TO $CHR4
MOVE [QUOTE %path%] TO $CHR6
DISPLAY $CHR6
ASEL
PROGRAM AGCY_MISSING.PG
LABEL AGAIN
SEL MISSING_AGCY
RES BY $RECNO = $NUM3
MOVE NAWDEX_AGCY TO $CHR5
DISPLAY 'COUNT IS  ',$NUM3,'  OUT OF  ',$NUM2,'  RECORDS ...'
DISPLAY 'LOCATING MISSING LAT/LONG FOR AGENCY   ',$CHR5
CA $NUM3 = $NUM3 + 1
CA $NM = 1
SEL COORDS
RES FLAG3 = 1
RES NAWDEX_AGCY CN $CHR5
FO $CHR9,40,C
CONCAT $CHR9 FROM 'OUTPUT ',$CHR6,'/missing.',$CHR5,' INIT'
DISPLAY $CHR9
DISPLAY '    '
EXEC $CHR9
REPORT MISSING.RPT Y 75
IF $NUM3 GT $NUM2
END
ELSE
GOTO AGAIN
ENDIF

RUN AGCY_MISSING.PG
ERASE AGCY_MISSING.PG
Y
REM
Q STOP
&end
/*
/* ----------------------------MAKING FREQUENCY INFO FILES
/*
&type Now making duplicate LAT/LONG frequency reports ...
&type
FREQUENCY COORDS REPORT5
FLAG2
END
END
FREQUENCY COORDS REPORT6
NAWDEX_AGCY
FLAG2
END
END
&type Now making missing LAT/LONG frequency reports ...
&type
FREQUENCY COORDS REPORT7
FLAG4
END
END
FREQUENCY COORDS REPORT8
NAWDEX_AGCY
FLAG4
```

```
END
END
&data arc info
ARC
CA $PRINTER-SIZE = 200
REM ---------------------ADMINISTRATOR'S SUMMARY OF
REM --------------------DUPLICATE LAT/LONG FOR STATE
SEL REPORT5
FO $CHR1,2,2,C
RES $RECNO = 1
MOVE [QUOTE %.state%] TO $CHR1
ASEL
SORT ON FLAG2
OUTPUT %path%/admin.rpt3 INIT
REPORT ADMIN.RPT3 LONG
3
1
200
8X
FREQUENCY
12
FREQUENCY
FLAG2
12
DUPLICATES
15X
[UNQUOTE ' ']
'NAWDEX DATA BASE ERRORS SUMMARY'
'FREQUENCY OF DUPLICATE LAT/LONG'
'FOR STATE OF-  ',$CHR1
Y
Y
75
[UNQUOTE ' ']
REM ----------------------ADMINISTRATOR'S SUMMARY OF
REM ----------------DUPLICATE LAT/LONG BY AGENCY FOR STATE
SEL REPORT6
SORT ON NAWDEX_AGCY,FLAG2
OUTPUT %path%/admin.rpt4 INIT
REPORT ADMIN.RPT4 LONG
3
1
200
8X
FREQUENCY
12
FREQUENCY
NAWDEX_AGCY
8
AGENCY
FLAG2
12
DUPLICATES
15X
[UNQUOTE ' ']
'NAWDEX DATA BASE ERRORS SUMMARY'
'FREQUENCY OF DUPLICATE LAT/LONG BY AGENCY'
'FOR STATE OF-  ',$CHR1
Y
```

```
Y
75
[UNQUOTE ' ']
REM ------------------------ADMINISTRATOR'S SUMMARY OF
REM ------------------------MISSING LAT/LONG FOR STATE
SEL REPORT7
FO $CHR1,2,2,C
RES $RECNO = 1
MOVE [QUOTE %.state%] TO $CHR1
ASEL
SORT ON FLAG4
OUTPUT %path%/admin.rpt5 INIT
REPORT ADMIN.RPT5 LONG
3
1
200
8X
FREQUENCY
12
FREQUENCY
FLAG4
12
MISSING
15X
[UNQUOTE ' ']
'NAWDEX DATA BASE ERRORS SUMMARY'
'FREQUENCY OF MISSING LAT/LONG'
'FOR STATE OF-  ',$CHR1
Y
Y
75
[UNQUOTE ' ']
REM --------------------------ADMINISTRATOR'S SUMMARY OF
REM -------------------MISSING LAT/LONG BY AGENCY FOR STATE
SEL REPORT8
SORT ON NAWDEX_AGCY,FLAG4
OUTPUT %path%/admin.rpt6 INIT
REPORT ADMIN.RPT6 LONG
3
1
200
8X
FREQUENCY
12
FREQUENCY
NAWDEX_AGCY
8
AGENCY
FLAG4
12
MISSING
15X
[UNQUOTE ' ']
'NAWDEX DATA BASE ERRORS SUMMARY'
'FREQUENCY OF MISSING LAT/LONG BY AGENCY'
'FOR STATE OF-  ',$CHR1
Y
Y
75
```

```
[UNQUOTE ' ']

Q STOP
&end
/*
&type
&type
&type //////////////////////////
&type
&type   MIS_DUP.AML complete ...
&type
&type //////////////////////////
&type
&type
/*
&return
/*
&routine get_out
&type
&type ***************  FAILURE *************************
&type
&type             MIS_DUP.AML has failed
&type   See CHK file in state directory for details
&type
&type ************************************************
&type
&workspace %.home%
&s cerr [close -all]
quit       /* exit arc
&stop
```

```
/*-------------------------------------------------------------------------
/*
/*  Command name:           GEO.AML
/*  Version:                1.0
/*  Language:               Arc Macro Language
/*  Arc Version/Platform:   6.0 / DGUX
/*  Subsystem:              Arc
/*
/*:::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::
/*
/*  Purpose: To identify NAWDEX sites containing geographic errors and
/*           write these errors to an ASCII file
/*
/*:::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::
/*
/*  Arguments: None
/*
/*:::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::
/*
/*  Programs or menus called: Called by DRIVER.AML
/*
/*:::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::
/*
/*  History:
/*
/*  Author/Site           Date     Version   Event
/*  ----------------------------------------------------------------
/*  Harrison/USGS-OR      9-91     1.0       Original coding
/*
/*:::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::
/*
/* Disclaimer:
/*  Although this program has been used by the U.S. Geological Survey, no
/*  warranty, expressed or implied, is made by the USGS as to the accuracy
/*  or functioning of the program.  No responsibility is assumed by the
/*  USGS in connection with this program's distribution or use.
/*
/*-------------------------------------------------------------------------
/*
&severity &error &routine get_out
&type
&type ============================================
&type
&type GEO.AML :  Version 1.0  :  [date -full]
&type
&type ============================================
&type
/*
&s path [dir [pathname workspace]]
&s termtype 9999
/*
/*       clean up
/*
&if [exists bnd.file -file] &then &sys rm bnd.file
&if [exists loc.tab -info] &then infodelete loc.tab
&if [exists mismatches -file] &then &sys rm mismatches
&if [exists numsel -file] &then &sys rm numsel
&if [exists loc.temp -cov] &then kill loc.temp
&if [exists poly.temp -cov] &then kill poly.temp
```

```
&if [exists county -coverage] &then kill county
&if [exists huc -coverage] &then kill huc
&if [exists loc.county -coverage] &then kill loc.county
&if [exists loc.huc -coverage] &then kill loc.huc
/*
/*        create statewide county coverage from national coverage
/*
&type
&type  creating county coverage for %.state% from national coverage ...
&type
&data arc RESELECT %.home%/reference/counties county poly
RES ST CN [QUOTE %.state%]
[UNQUOTE ' ']
n
n
&end
&end
/*
/*       overlay state county coverage with LOC point coverage
/*
&type
&type Merging LOC point coverage with COUNTY polygon coverage ...
&type
IDENTITY loc county loc.county point
ADDITEM loc.county.pat loc.county.pat flag 1 1 i
&end
/*
/*      create statewide hydrologic unit coverage from national coverage
/*
&type
&type Creating hydrologic unit coverage for %.state% from national coverage ...
&type
CLIP %.home%/usa/hucs county huc poly
&end
/*
/*         overlay state hydrologic units with LOC point coverage
/*
&type
&type Merging LOC point coverage with HUC polygon coverage ...
&type
IDENTITY loc huc loc.huc point
ADDITEM loc.huc.pat loc.huc.pat flag 1 1 i
&end
/*
/*         redefine INFO items for comparison purposes
/*
&data arc info
ARC
SEL HUC.PAT
RED
18,HUCCHR,8,8,C
18,HUCCHR2,8,8,C
[UNQUOTE ' ']
SEL LOC.HUC.PAT
RED
127,HUCCHR,8,8,C
127,HUCI,8,8,I
127,LEADING,1,1,C
256,HUCCHR2,8,8,C
```

```
[UNQUOTE ' ']
SEL COUNTY.PAT
RED
19,COUNTYCHR,3,3,C
19,COUNTYCHR2,3,3,C
17,STATECHR,2,2,C
[UNQUOTE ' ']
SEL LOC.COUNTY.PAT
RED
124,COUNTYCHR,3,3,C
122,STATECHR,2,2,C
257,COUNTYCHR2,3,3,C
[UNQUOTE ' ']
CA FIPS:CO = FIPS:CO
Q STOP
&end
/*
/*       check LOC items against items from reference coverage
/*
&do .cover &list STATE HUC COUNTY
/*
/*     1. checking state fips code
/*
&if %.cover% eq STATE &then &do
&data arc info
ARC
FO $CHR1,2,2,C
SEL LOC.COUNTY.PAT
CA $PRINTER-SIZE = 200
CA FLAG = 0
CA $NM = 1
MOVE [QUOTE %.state%] TO $CHR1
REM
REM ---------------------- identify invalid state fips codes
REM
REL COUNTY.PAT STATECHR
RES STATECHR NE $1STATECHR
CA FLAG = 1
OUTPUT %path%/errors APPEND
PRINT 1T,NAWDEX_AGCY,'!',AGCY_STA_NO,'!',STATION_NAME,'!',STATE,'!',~
'STATE','!',STATE,'!','Invalid state FIPS code'
ASEL
REM
REM --------------------- identify sites with no state fips code
REM
RES STATE = 0
CA FLAG = 1
OUTPUT %path%/errors APPEND
PRINT 1T,NAWDEX_AGCY,'!',AGCY_STA_NO,'!',STATION_NAME,'!',STATE,'!',~
'STATE','!',STATE,'!','Missing mandatory state FIPS code'
ASEL
REM
REM ------------------- identify sites which plot outside state
REM
RES FIPS:ST = 0
CA FLAG = 1
OUTPUT %path%/errors APPEND
PRINT 1T,NAWDEX_AGCY,'!',AGCY_STA_NO,'!',STATION_NAME,'!',STATE,'!',~
'STATE','!',STATE,'!','Site has plotted outside state of ',$CHR1,'. Check lat/long','!'
```

```
Q STOP
&end
&end
/*
/*              2. check hydrologic unit code
/*
&if %.cover% eq HUC &then &do
&s .polyitemchr [TRANSLATE hucchr2]
&s .locitemchr [TRANSLATE hucchr]
&s .polyitemint [TRANSLATE huc]
&s .locitemint [TRANSLATE huci ]
&s .itemchkd HYDROL_UNIT
&data arc info
ARC
FO $CHR1,2,2,C
SEL LOC.HUC.PAT
REM
REM ----------------------- remove leading zero from huc
REM
RES LEADING CN '0'
MOVE ' ' TO LEADING
ASEL
CA $PRINTER-SIZE = 200
CA $NM = 1
CA FLAG = 0
MOVE [QUOTE %.state%] TO $CHR1
REM
REM ---------------------- identify sites with invalid hydrologic unit code
REM
REL HUC.PAT HUCCHR
RES HUCCHR NE $1HUCCHR
CA FLAG = 1
RES HUCCHR NC '99999999'
OUTPUT %path%/errors APPEND
PRINT 1T,NAWDEX_AGCY,'!',AGCY_STA_NO,'!',STATION_NAME,'!',STATE,'!',~
'HYDROL_UNIT','!',HYDROL_UNIT,'!','Invalid HUC for state of ',$CHR1,'!'
ASEL
REM
REM ------------- flag sites which are missing nonmandatory hydrologic unit
REM
RES HUC = 0
CA FLAG = 1
ASEL
REM
REM ----------------- identify sites which plot outside of hydrologic unit
REM
RES FLAG NE 1
RES HUCCHR NE HUCCHR2
OUTPUT %path%/numsel INIT
PRINT 1T,$NOSEL
Q STOP
&end
&end
/*
/*                3. check county fips code
/*
&if %.cover% eq COUNTY &then &do
&s .polyitemchr [TRANSLATE countychr2]
&s .locitemchr [TRANSLATE countychr]
```

```
&s .polyitemint [TRANSLATE fips:co]
&s .locitemint [TRANSLATE county]
&s .itemchkd COUNTY
&data arc info
ARC
FO $CHR1,2,2,C
SEL LOC.COUNTY.PAT
CA $PRINTER-SIZE = 200
CA $NM = 1
CA FLAG = 0
MOVE [QUOTE %.state%] TO $CHR1
REM
REM ------------------- identify sites with invalid county fips code
REM
REL COUNTY.PAT COUNTYCHR
RES COUNTYCHR NE $1COUNTYCHR
CA FLAG = 1
RES COUNTYCHR NC '999'
OUTPUT %path%/errors APPEND
PRINT 1T,NAWDEX_AGCY,'!',AGCY_STA_NO,'!',STATION_NAME,'!',STATE,'!',~
'COUNTY','!',COUNTY,'!','Invalid county code for state of ',$CHR1,'!'
ASEL
REM
REM ------------- flag sites which are missing nonmandatory county
REM
RES FIPS:CO = 0
CA FLAG = 1
ASEL
REM
REM ------------------ identify sites which plot outside of county
REM
RES FLAG NE 1
RES COUNTY NE FIPS:CO
OUTPUT %path%/numsel INIT
PRINT 1T,$NOSEL
Q STOP
&end
&end
/*
/*       calculate distance to nearest border for sites falling outside
/*                      of hydrologic unit or county
/*
/*             (sites falling outside state will not be measured)
/*
&if %.cover% eq STATE &then &goto around
/*
&s filunit1 [open numsel openstatus -r]
&s apflag [read %filunit1% readstatus]
&if [close %filunit1%] ne 0 &then &return &warning Unable to close numsel file
/*
/*     if no sites fell outside of huc or county then no calculation needed
/*
&if %apflag% cn '    0' &then &goto around
/*
/*        define search distance for near command based on coverage boundary
/*
&describe %.cover%
&s .minx [round %$dsc.xmin%]
&s .maxx [round %$dsc.xmax%]
```

```
&s .miny [round %$dsc.ymin%]
&s .maxy [round %$dsc.ymax%]
&s .difx [calc %.maxx% - %.minx%]
&s .dify [calc %.maxy% - %.miny%]
&s .hyp [sqrt [calc %.difx% * %.difx% + %.dify% * %.dify%]]
&type
&type Near command search distance = %.hyp%
&type
/*
/*      make INFO file of sites which fall outside huc or county
/*
AP
RES loc.%.cover% point flag ne 1
RES loc.%.cover% point %.locitemchr% nc %.polyitemchr%
STATISTICS loc.%.cover% point %.locitemchr% loc.tab
   SUM flag
   END
QUIT
/*
/*      write INFO file to system ASCII file
/*
&data arc info
ARC
CA $COMMA-SWITCH = -1
SEL LOC.TAB
OUTPUT %path%/mismatches INIT
PRINT 1T, $NOSEL
PRINT 1T, %.locitemchr%
ERASE LOC.TAB
Y
Q STOP
&end
/*
/*     loop through ASCII file for each huc or county
/*
&s fileunit2 [open %path%/mismatches openstatus -r]
&s .totrec [read %fileunit2% readstatus]
&s .totrec = [trim %.totrec% -left [unquote ' ']]
&do count = 1 &to %.totrec% &by 1
&type 'Count = ' %count% ' out of ' %.totrec%
&s .var [read %fileunit2% readstatus]
&type Record %count% value is %.var%
/*
/*     check each record for BLANK or NULL values
/*
&if %.cover% eq HUC &then
  &do
    &select %.var%
      &when '         ','       ','      ','     ','    ','   ','  ' '
        &s skip = 1
      &when [null]
        &s skip = 1
      &otherwise
        &s skip = 0
    &end
  &end
&if %.cover% eq COUNTY &then
  &do
    &select %.var%
```

```
      &when '    ','  ',' '
        &s skip = 1
      &when [null]
        &s skip = 1
      &otherwise
        &s skip = 0
    &end
  &end
/*
/*        if record is BLANK or NULL then skip to next one
/*
&if %skip% eq 1 &then &goto forget_it
/*
/*        create polygon coverage of each huc or county in file
/*
&data arc RESELECT %.cover% poly.temp poly
RES %.polyitemint% eq [UNQUOTE %.var%]
[UNQUOTE ' ']
n
n
&end
/*
/*      create point coverage of all points in LOC which are coded
/*      in this  polygon but which do not plot in this polygon
/*
&data arc RESELECT loc.%.cover% loc.temp point
RES %.locitemint% ne %.polyitemint%
[UNQUOTE ' ']
n
y
RES flag ne 1
[UNQUOTE ' ']
n
y
RES %.locitemint% eq [UNQUOTE %.var%]
[UNQUOTE ' ']
n
n
&end
/*
/*         calculate distance from points to polygon
/*
NEAR loc.temp poly.temp line %.hyp%
ADDITEM loc.temp.pat loc.temp.pat miledist 4 12 f 3 distance
&data arc info
ARC
SEL LOC.TEMP.PAT
CA $PRINTER-SIZE = 200
CA MILEDIST = DISTANCE / 1609.2
OUTPUT %path%/errors APPEND
PRINT 1T,NAWDEX_AGCY,'!',AGCY_STA_NO,'!',STATION_NAME,'!',STATE,'!',~
[QUOTE %.itemchkd%],'!',%.itemchkd%,'!','Site plots outside of ',~
[QUOTE %.cover%],' by ',MILEDIST,' miles. Lat/long plots in ',~
[QUOTE %.cover%],' ',%.polyitemchr%,'!'
Q STOP
&end
/*
/*     skip to here if BLANK or NULL; get next record
/*
```

```
&label forget_it
/*
/*     clean up
/*
&if [exists poly.temp -cov] &then kill poly.temp
&if [exists loc.temp -cov] &then kill loc.temp
/*
/*     end of do count loop; get another record from file
/*
&end
&type [close %fileunit2%]
/*
/*    skip to here if no sites fell outside huc or county
/*
&label around
/*
/*    end of do list; get another coverage (STATE,HUC,COUNTY)
/*
&end
/*
/*    clean up
/*
&sys rm numsel
&sys rm mismatches
&sys rm bnd.file
&sys rm xx*
/*
&type
&type
&type ////////////////////////////
&type
&type   GEO.AML complete ...
&type
&type ////////////////////////////
&type
&type
/*
&return
/*
/*
&routine get_out
&type
&type ***************  FAILURE ************************
&type
&type             GEO.AML has failed
&type   See CHK file in state directory for details
&type
&type ***************************************************
&type
&workspace %.home%
&s cerr [close -all]
quit       /* exit arc
&stop
```

```
/*-------------------------------------------------------------------------
/*
/*  Command name:           REPORTS.AML
/*  Version:                1.0
/*  Language:               Arc Macro Language
/*  Arc Version/Platform:   6.0 / DGUX
/*  Subsystem:              Arc
/*
/*:::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::
/*
/*  Purpose: To produce INFO reports for errors identified in NWDX MWDI
/*
/*  Produces 3 INFO reports for NAWDEX project:
/*         1. errors.rpt (from NONGEO and GEO AMLs)
/*         2. admin.rpt1 (frequency of errors by state)
/*         3. admin.rpt2 (frequency of errors by agency for state)
/*
/*
/*:::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::
/*
/*  Arguments: None
/*
/*:::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::
/*
/*  Programs or menus called: Called by DRIVER.AML
/*
/*:::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::
/*
/*  History:
/*
/*  Author/Site           Date     Version   Event
/*  ----------------------------------------------------------------
/*  Harrison/USGS-OR      9-91     1.0       Original coding
/*
/*:::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::
/*
/* Disclaimer:
/*  Although this program has been used by the U.S. Geological Survey, no
/*  warranty, expressed or implied, is made by the USGS as to the accuracy
/*  or functioning of the program.  No responsibility is assumed by the
/*  USGS in connection with this program's distribution or use.
/*
/*-------------------------------------------------------------------------
/*
&severity &error &routine get_out
&type
&type ============================================
&type
&type REPORTS.AML :  Version 1.0  :  [date -full]
&type
&type ============================================
&type
/*
&s path [dir [pathname workspace]]
/*
/* clean up
/*
&if [exists errors.wpn -file] &then rm errors.wpn
&if [exists errors.rpt -file] &then rm errors.rpt
```

```
&if [exists admin.rpt1 -file] &then rm admin.rpt1
&if [exists admin.rpt2 -file] &then rm admin.rpt2
&if [exists errors.wpn -info] &then infodelete errors.wpn
&if [exists admin.rpt1 -info] &then infodelete admin.rpt1
&if [exists admin.rpt2 -info] &then infodelete admin.rpt2
&if [exists report1 -info] &then infodelete report1
&if [exists report1a -info] &then infodelete report1a
&if [exists report2 -info] &then infodelete report2
&if [exists report3 -info] &then infodelete report3
&if [exists report4 -info] &then infodelete report4
/*
&data arc info
ARC
CA $PRINTER-SIZE = 200
DEFINE REPORT1
AGENCY,6,C
ID,16,C
NAME,49,C
STATECODE,3,C
ITEM,17,C
VALUE,15,C
ERROR,86,C
[UNQUOTE ' ']
DELIMETER !
ADD FROM %path%/errors
DEFINE REPORT1A
AGENCY,6,C
ID,16,C
NAME,49,C
STATECODE,3,C
ITEM,17,C
VALUE,15,C
ERROR,86,C
[UNQUOTE ' ']
DELIMETER !
ADD FROM %path%/errors
SEL REPORT1A
RES $RECNO = 1
MOVE [QUOTE %.state%] TO $CHR1
ASEL
RES ITEM CN 'LST_UPDATE' OR ITEM CN 'INTERRUPTED' OR ITEM CN 'RECMD_MTHDS'
PURGE
Y
ASEL
SORT ON AGENCY,ID,ITEM
OUTPUT %path%/errors.wpn INIT
REPORT ERRORS.WPN LONG
1
1
200
4X
AGENCY
P
AGENCY
ID
[UNQUOTE ' ']
SITE ID
NAME
[UNQUOTE ' ']
```

```
STATION NAME
ITEM
[UNQUOTE ' ']
PARAMETER
VALUE
[UNQUOTE ' ']
VALUE
ERROR
[UNQUOTE ' ']
DISCREPANCY
[UNQUOTE ' ']
'NAWDEX DATA BASE ERRORS FOR YOUR AGENCY IN STATE OF ',$CHR1
Y
Y
75
[UNQUOTE ' ']
Q STOP
&end
&type Making frequency reports ...
FREQUENCY REPORT1 REPORT2
ITEM
END
END
FREQUENCY REPORT1 REPORT3
AGENCY
ITEM
END
END
FREQUENCY REPORT1 REPORT4
AGENCY
END
END
&data arc info
ARC
CA $PRINTER-SIZE = 200
FO $CHR1,2,2,C
SEL REPORT2
RES $RECNO = 1
MOVE [QUOTE %.state%] TO $CHR1
ASEL
SORT ON ITEM
OUTPUT %path%/admin.rpt1 INIT
REPORT ADMIN.RPT1 LONG
3
1
200
8X
FREQUENCY
10
FREQUENCY
ITEM
[UNQUOTE ' ']
PARAMETER
[UNQUOTE ' ']
'NAWDEX DATA BASE ERRORS SUMMARY'
'FREQUENCY OF ERRORS BY PARAMETER'
'FOR STATE-  ',$CHR1
Y
Y
```

```
75
[UNQUOTE ' ']
SEL REPORT3
SORT ON AGENCY,ITEM
OUTPUT %path%/admin.rpt2 INIT
REPORT ADMIN.RPT2 LONG
3
1
200
8X
FREQUENCY
10
FREQUENCY
AGENCY
[UNQUOTE ' ']
AGENCY
ITEM
[UNQUOTE ' ']
PARAMETER
[UNQUOTE ' ']
'NAWDEX DATA BASE ERRORS SUMMARY'
'FREQUENCY OF ERRORS BY AGENCY AND PARAMETER'
'FOR STATE-    ',$CHR1
Y
Y
75
[UNQUOTE ' ']
SEL REPORT4
RED
9,AGENCYCODE,5,5,C
[UNQUOTE ' ']
Q STOP
&end
/*
/* Removing page numbers and dates
/* from head of each page
/*
&sys sed '/PAGE/d' errors.wpn | cat > errors.rpt
&sys rm errors.wpn errors
/*
&type Copying ADMIN.RPT1 - ADMIN.RPT6 to statistics directory ...
&sys cp admin.rpt1 /reach/nawdex/reference/statistics/[locase %.state%].rpt1
&sys cp admin.rpt2 /reach/nawdex/reference/statistics/[locase %.state%].rpt2
&sys cp admin.rpt3 /reach/nawdex/reference/statistics/[locase %.state%].rpt3
&sys cp admin.rpt4 /reach/nawdex/reference/statistics/[locase %.state%].rpt4
&sys cp admin.rpt5 /reach/nawdex/reference/statistics/[locase %.state%].rpt5
&sys cp admin.rpt6 /reach/nawdex/reference/statistics/[locase %.state%].rpt6
/*
&type
&type
&type //////////////////////////
&type
&type   REPORTS.AML complete ...
&type
&type //////////////////////////
&type
&type
/*
&return
```

```
/*
/*
&routine get_out
&type
&type ***************  FAILURE *************************
&type
&type             REPORTS.AML has failed
&type    See CHK file in state directory for details
&type
&type ************************************************
&type
&workspace %.home%
&s cerr [close -all]
quit        /* exit arc
&stop
```

```
/*-------------------------------------------------------------------------
/*
/*  Command name:           PRINT.AML
/*  Version:                1.0
/*  Language:               Arc Macro Language
/*  Arc Version/Platform:   6.0 / DGUX
/*  Subsystem:              Arc
/*
/*:::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::
/*
/*  Purpose: To print reports produced on Laser printer
/*
/*  This aml must be run on DG/UX system
/*  This aml will print all reports to be
/*  distributed as follows:
/*
/*    ADMIN.RPT1, ADMIN.RPT2        -to NAWDEX administrator
/*    ADMIN.RPT3, ADMIN.RPT4
/*    ADMIN.RPT5, ADMIN.RPT6
/*
/*    ERRORS.RPT, DUPS.<agency>     -to responsible agency
/*    MISSING.<agency>
/*
/*
/*:::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::
/*
/*  Arguments: 2 letter state abbreviation
/*
/*:::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::
/*
/*  Programs or menus called: None
/*
/*:::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::
/*
/*  History:
/*
/*  Author/Site           Date     Version   Event
/*  ------------------------------------------------------------------
/*  Harrison/USGS-OR      9-91     1.0       Original coding
/*
/*:::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::
/*
/* Disclaimer:
/*  Although this program has been used by the U.S. Geological Survey, no
/*  warranty, expressed or implied, is made by the USGS as to the accuracy
/*  or functioning of the program.  No responsibility is assumed by the
/*  USGS in connection with this program's distribution or use.
/*
/*-------------------------------------------------------------------------
/*
&args .state
/*
&severity &error &routine get_out
/*
&if [null %.state%] &then &do
  &type Usage: PRINT.AML <STATE_ABBREV>
  &return
  &end
/*
```

```
&if ^ [exists %.state% -dir] &then
  &do
    &type "%.state%" state directory NOT found ...
    &return
  &end
/*
&s .home /reach/nawdex
/*
&select [locase [show program]]
  &when arc
    &do
      &type
      &type
      &type//////////////////////////////////////////////////////////////////////
      &type
      &type Disclaimer:
      &type
      &type Although this program has been used by the U.S. Geological Survey,
      &type no warranty, expressed or implied, is made by the USGS as to the
      &type accuracy or functioning of the program.  No responsibility is assumed
      &type by the USGS in connection with this program's distribution or use.
      &type
      &type //////////////////////////////////////////////////////////////////////
      &type
      &type PRINT.AML :  Version 1.0  :  [date -full]
      &type
      &s tube [extract 1 [show &term]]
      &if [null %tube%] &then
        &do
          &term 9999 &mouse
          display 9999 position ul screen
        &end
    &end
  &otherwise
    &do
      &type This program is run from ARC prompt ...
      &stop
    &end
&end
/*
/*-------------------- MAKING LABELS FILE AND PRINTING COVER LETTERS
/*
&workspace reference
&s path [dir [pathname workspace]]
&if [exists flag -file] &then rm flag
&if [exists report4 -info] &then infodelete report4
&if [exists customer.dat -file] &then
  &do
    &type customer.dat file already exists, deleting file ...
    &sys rm customer.dat
  &end
/*
&if [exists labels.%.state% -file] &then
  &do
    &type labels.%.state% file already exists, deleting file ...
    &sys rm labels.%.state%
  &end
&data arc info
ARC
```

```
CA $PRINTER-SIZE = 200
ADIR %.home%/%.state%/info
TAKE DATA ARC REPORT4
PROGRAM LET_LAB
SEL REPORT4
RES AGENCY NC 'US'
OUTPUT %path%/flag INIT
PRINT 1T,$NOSEL
OUTPUT %path%/customer.dat INIT
REL AGENCIES BY AGENCYCODE
NEXT
PRINT 1T,$1CONTACT,'|',$1ORGNAME,'|',$1STREET,'|',$1CITY,'|',$1STATE,'|',$1ZIP,~
'|',$1AGENCYCODE
OUTPUT %path%/labels.%.state% INIT
PROGRAM SECTION TWO
PRINT $1CONTACT,'--',$1AGENCYCODE
PRINT $1ORGNAME
PRINT $1STREET
PRINT $1CITY,1X,$1STATE,1X,$1ZIP
PRINT '    '
PRINT '    '
NEXT
PROGRAM SECTION THREE
END

RUN LET_LAB
ERASE LET_LAB
Y
Q STOP
&end
/*
&s filunit [open flag openstatus -r]
&s skip [read %filunit% readstatus]
&if [close %filunit%] ne 0 &then &type Could not close file FLAG ...
&select [unquote %skip%]
  &when 0
    &do
      &type
      &type
      &type [translate %.state%] has no STATE agencies.
      &type All cover letters and labels will be found
      &type in federal government folders ...
      &type
      &type
    &end
  &otherwise
    &do
      &type
      &type
      &type Now insert letterhead to manual feed slot on postscript printer
      &type RAPS.  NAWDEX logo should be facing you and upside down.
      &type Insert sheets one at a time for number of records indicated by
      &type FrameMaker ...
      &type
      &type
      /usr/opt/frame2.1/bin/fmmerge customer -n -p
    &end
&end
/*
```

```
/*
&workspace %.home%/%.state%
&if ^ [exists errors.rpt -file] and  ^ [exists dups* -file] and ~
 ^ [exists missing* -file] &then
  &do
    &type NO error files found ...
    &workspace %.home%
    &return
  &end
&type
&type
&pause
&type
&type Now printing reports at RAPS ...
&type
/*
/*------------------------- PRINTING DUPLICATE LAT/LONG REPORTS
/*
&type 1. Duplicate LAT/LONG reports ...
&s skip = 0
&s count [filelist dups.* dupslist -full -file]
&if %count% = 0 &then &do
  &type NO dups.<agency> files found ???
  &s skip = 1
  &end
&if %skip% = 1 &then &goto skipit1
&s filunit [open dupslist openstatus -r]
&do i = 1 &to %count%
  &s filename [read %filunit% readstatus]
  cat [locase %filename%]|fpr|remsh ra enscript -B -r -fCourier6
  &end
&type [close %filunit%]
&label skipit1
&type [delete dupslist -file]
/*
/*----------------------------- PRINTING MISSING LAT/LONG REPORTS
/*
&type 2. Missing LAT/LONG reports ...
&s skip = 0
&s count [filelist missing.* missinglist -full -file]
&if %count% = 0 &then &do
  &type NO missing.<agency> files found ???
  &s skip = 1
  &end
&if %skip% = 1 &then &goto skipit2
&s filunit [open missinglist openstatus -r]
&do i = 1 &to %count%
  &s filename [read %filunit% readstatus]
  cat [locase %filename%]|fpr|remsh ra enscript -B -r -fCourier6
  &end
&type [close %filunit%]
&label skipit2
&type [delete missinglist -file]
/*
/*------------------------------ PRINTING ADMINISTRATOR'S REPORTS
/*
&type 3. Administrator's summary reports ...
&s skip = 0
&s count [filelist admin.* adminlist -full -file]
```

```
&if %count% = 0 &then &do
  &type NO admin.rpt files found ???
  &s skip = 1
  &end
&if %skip% = 1 &then &goto skipit3
&s filunit [open adminlist openstatus -r]
&do i = 1 &to %count%
  &s filename [read %filunit% readstatus]
  cat [locase %filename%]|fpr|remsh ra enscript -B -r -fCourier6
  &end
&type [close %filunit%]
&label skipit3
&type [delete adminlist -file]
/*
/*---------------------------------- PRINTING AGENCY ERRORS REPORT
/*
&type 4. Individual agency error reports ...
&s skip = 0
&if ^ [exists errors.rpt -file] &then &do
  &type NO errors.rpt file found ???
  &s skip = 1
  &end
&if %skip% = 1 &then &goto skipit4
&sys cat errors.rpt|fpr|remsh ra enscript -B -r -fCourier6
&label skipit4
/*
/*
&type
&type  *** Make sure to keep paper tray filled on postscript printer RAPS ***
&type
&if [exists flag -file] &then rm flag
&workspace %.home%
&type
&type ================================================================================
&type
&type Distribute outputs as follows:
&type
&type   NAWDEX administrator-  ADMIN.RPT1,ADMIN.RPT2,ADMIN.RPT3,ADMIN.RPT4
&type                          ADMIN.RPT5,ADMIN.RPT6
&type   Responsible agency-    Cover letter, ERRORS.RPT, all DUPS.(agency)
&type                          and all MISSING.(agency) reports
&type
&type ================================================================================
&type
/*
&return
/*
&routine get_out
&type
&type ***************  FAILURE ************************
&type
&type             PRINT.AML has failed
&type
&type ************************************************
&type
&workspace %.home%
&s cerr [close -all]
&stop
```

Appendix B

DATAFILE NAME: LOC.PAT

42 ITEMS: STARTING IN POSITION 1

COL	ITEM NAME	WDTH	OPUT	TYP	N.DEC	ALTERNATE NAME
1	AREA	4	12	F	3	
5	PERIMETER	4	12	F	3	
9	LOC#	4	5	B	-	
13	LOC-ID	4	5	B	-	
17	NAWDEX#	4	5	B	-	
21	NAWDEX-ID	22	22	C	-	
43	NAWDEX_AGCY	5	5	C	-	
48	AGCY_STA_NO	15	15	C	-	
63	STATION_NAME	48	48	C	-	
111	NON_US_COUNTRY	2	2	C	-	
113	STATE	3	3	I	-	
116	COUNTY	3	3	I	-	
119	HYDROL_UNIT	12	12	C	-	
131	CONG_DIST	3	3	I	-	
134	SITE_TYPE	2	2	C	-	
136	BASIN_DESCRP	3	3	I	-	
139	WDSD_OFC_CODE	9	9	C	-	
148	DRAIN_AREA	9	9	I	-	
157	NC_AREA	1	1	C	-	
158	LAST_UPDATE	6	6	C	-	
164	STATE_COUNTY	5	5	I	-	
169	PRIMARY_USE	1	1	C	-	
170	WRD_ACCT	1	1	C	-	
171	DOWNSTREAM_ORDER	15	15	C	-	
186	OTHER_DATA	9	9	C	-	
195	SW_ACTIVE	1	1	C	-	
196	SW_KEY	4	5	B	-	
200	GW_ACTIVE	1	1	C	-	
201	GW_KEY	4	5	B	-	
205	QW_ACTIVE	1	1	C	-	
206	QW_KEY	4	5	B	-	
210	BIO_ACTIVE	1	1	C	-	
211	BIO_KEY	4	5	B	-	
215	PHY_ACTIVE	1	1	C	-	
216	PHY_KEY	4	5	B	-	
220	SED_ACTIVE	1	1	C	-	
221	SED_KEY	4	5	B	-	
225	CHM_ACTIVE	1	1	C	-	
226	CHM_KEY	4	5	B	-	
230	MET_ACTIVE	1	1	C	-	
231	MET_KEY	4	5	B	-	
235	MISC_INFO_KEY	4	5	B	-	

DATAFILE NAME: SW_DATA

31 ITEMS: STARTING IN POSITION 1

COL	ITEM NAME	WDTH	OPUT	TYP	N.DEC	ALTERNATE NAME
1	NAWDEX#	4	5	B	-	
5	SW_BEGIN_YR	4	4	I	-	
9	SW_END_YR	4	4	I	-	
13	SW_INTERRUPTED	1	1	C	-	
14	SW_OWDC_NO	5	5	C	-	
19	SW_OWDC_SEQ	13	13	C	-	
32	COMPLETE	1	1	C	-	
33	PEAK_STAGE	1	1	C	-	
34	LOW_STAGE	1	1	C	-	
35	STAGE_MED	1	1	C	-	
36	COMPLETE_FLOW	1	1	C	-	
37	PEAK_FLOW	1	1	C	-	
38	LOW_FLOW	1	1	C	-	
39	MISC_FLOW_MEAS	1	1	C	-	
40	FLOW_MED	1	1	C	-	
41	VOLUME	1	1	C	-	
42	VOLUME_CHANGE	1	1	C	-	
43	VOLUME_MED	1	1	C	-	
44	SW_UNIT_FLOW	1	1	C	-	
45	SW_UNIT_STAGE	1	1	C	-	
46	SW_UNIT_VOLUME	1	1	C	-	
47	SW_RECMD_MTHDS	1	1	C	-	
48	SW_OTHER	12	12	C	-	
60	SW_TELEMETRY	1	1	C	-	
61	SW_LST_UPDATE	4	4	I	-	
65	SW_PURPOSE	9	9	C	-	
74	SW_RECORDER_TYPE	1	1	C	-	
75	SW_RECORDER_FREQ	1	1	C	-	
76	SW_PN_CODE	1	1	C	-	
77	SW_MODIFIERS	80	80	C	-	
157	KEY-LOC	4	5	B	-	
	** REDEFINED ITEMS **					
5	SW	152	152	C	-	
61	DATEC	4	4	C	-	

DATAFILE NAME: GW_DATA

25 ITEMS: STARTING IN POSITION 1

COL	ITEM NAME	WDTH	OPUT	TYP	N.DEC	ALTERNATE NAME
1	NAWDEX#	4	5	B	-	
5	GW_BEGIN_YR	4	4	I	-	
9	GW_END_YR	4	4	I	-	
13	GW_INTERRUPTED	1	1	C	-	
14	GW_OWDC_NO	5	5	C	-	
19	PRIN_AQUIFER	8	8	C	-	
27	AQUIFER_TYPE	1	1	C	-	
28	LEVEL_FREQ	1	1	C	-	
29	LEVEL_MED	1	1	C	-	
30	DISCHRG_FREQ	1	1	C	-	
31	DISCHRG_MED	1	1	C	-	
32	SUBSIDE_FREQ	1	1	C	-	
33	SUBSIDE_MED	1	1	C	-	
34	WELL_DEPTH	5	5	I	-	
39	GW_RECMD_MTHDS	1	1	C	-	
40	GW_OTHER	12	12	C	-	
52	MAJOR_VAR	4	4	C	-	
56	GW_TELEMETRY	1	1	C	-	
57	GW_LST_UPDATE	4	4	I	-	
61	GW_PURPOSE	9	9	C	-	
70	GW_RECORDER_TYPE	1	1	C	-	
71	GW_RECORDER_FREQ	1	1	C	-	
72	GW_PN_CODE	1	1	C	-	
73	GW_POINTER	80	80	C	-	
153	KEY-LOC	4	5	B	-	
	** REDEFINED ITEMS **					
5	GW	148	148	C	-	
57	DATEC	4	4	C	-	

DATAFILE NAME: QW_DATA

16 ITEMS: STARTING IN POSITION 1

COL	ITEM NAME	WDTH	OPUT	TYP	N.DEC	ALTERNATE NAME
1	NAWDEX#	4	5	B	-	
5	QW_BEGIN_YR	4	4	I	-	
9	QW_END_YR	4	4	I	-	
13	QW_INTERRUPTED	1	1	C	-	
14	QW_OWDC_NO	5	5	C	-	
19	QW_OWDC_SEC	13	13	C	-	
32	QW_RECMD_MTHDS	1	1	C	-	
33	QW_TELEMETRY	1	1	C	-	
34	QW_LST_UPDATE	4	4	I	-	
38	QW_PURPOSE	9	9	C	-	
47	QW_RECORDER_TYPE	1	1	C	-	
48	QW_RECORDER_FREQ	1	1	C	-	
49	QW_PN_CODE	1	1	C	-	
50	STORET_POINTER	7	7	C	-	
57	QW_MODIFIERS	80	80	C	-	
137	KEY-LOC	4	5	B	-	
	** REDEFINED ITEMS **					
5	QW	132	132	C	-	
34	DATEC	4	4	C	-	

DATAFILE NAME: BIO_DATA

28 ITEMS: STARTING IN POSITION 1

COL	ITEM NAME	WDTH	OPUT	TYP	N.DEC	ALTERNATE NAME
1	NAWDEX#	4	5	B	-	
5	ENTERIC_BACT	1	1	C	-	
6	NATIVE_BACT	1	1	C	-	
7	PHYTOPLANKTON	1	1	C	-	
8	ZOOPLANKTON	1	1	C	-	
9	PERIPHYTON	1	1	C	-	
10	MACROPHYTON	1	1	C	-	
11	MICROINVERTS	1	1	C	-	
12	MACROINVERTS	1	1	C	-	
13	VERTEBRATES	1	1	C	-	
14	FUNGI	1	1	C	-	
15	VIRUSES	1	1	C	-	
16	BIO_RECMD_MTHDS	1	1	C	-	
17	BIO_BEGIN_YR	4	4	I	-	
21	BIO_END_YR	4	4	I	-	
25	BIO_LST_UPDATE	4	4	I	-	
29	BIOLOGIC_MED	1	1	C	-	
30	PRIMARY_PRDCTVTY	1	1	C	-	
31	SCENDARY_PRDCTV	1	1	C	-	
32	CHEMOSYNTHETIC_A	1	1	C	-	
33	BIOSTIMULATORY_T	1	1	C	-	
34	TOXICITY_TEST	1	1	C	-	
35	OTHER_BIOASSAY_T	1	1	C	-	
36	CHM_TISSUE_ANALY	1	1	C	-	
37	HISTOPATH_ANALYS	1	1	C	-	
38	OTHER_TISSUE_ANA	1	1	C	-	
39	BIO_MODIFIERS	80	80	C	-	
119	KEY-LOC	4	5	B	-	
	** REDEFINED ITEMS **					
5	BIO	114	114	C	-	
25	DATEC	4	4	C	-	

DATAFILE NAME: CHM_DATA

28 ITEMS: STARTING IN POSITION 1

COL	ITEM NAME	WDTH	OPUT	TYP	N.DEC	ALTERNATE NAME
1	NAWDEX#	4	5	B	-	
5	SOLIDS_DIS	1	1	C	-	
6	MAJOR_IONS	1	1	C	-	
7	HARDNESS	1	1	C	-	
8	SILICA	1	1	C	-	
9	PHOSPHORUS	1	1	C	-	
10	PHOS_SPECIES	1	1	C	-	
11	NITROGEN	1	1	C	-	
12	N_SPECIES	1	1	C	-	
13	DETERGENTS	1	1	C	-	
14	OMI_CONSTITS	1	1	C	-	
15	RADIOACTIVITY	1	1	C	-	
16	RCHM_SPECIES	1	1	C	-	
17	CARBON	1	1	C	-	
18	ORG_GROUPS	1	1	C	-	
19	PEST_SPECIES	1	1	C	-	
20	OTH_ORG_SPECIES	1	1	C	-	
21	BIOCHEM_OX_DMND	1	1	C	-	
22	CHEM_OX_DMND	1	1	C	-	
23	DISSOLVED_OX	1	1	C	-	
24	OTHER_DIS_GAS	1	1	C	-	
25	CHEM_RECMD_MTHDS	1	1	C	-	
26	CHM_BEGIN_YR	4	4	I	-	
30	CHM_END_YR	4	4	I	-	
34	CHM_LST_UPDATE	4	4	I	-	
38	CHEMICAL_MED	1	1	C	-	
39	CHM_MODIFIERS	80	80	C	-	
119	KEY-LOC	4	5	B	-	
	** REDEFINED ITEMS **					
5	CHM	114	114	C	-	
34	DATEC	4	4	C	-	

DATAFILE NAME: PHY_DATA

15 ITEMS: STARTING IN POSITION 1

COL	ITEM NAME	WDTH	OPUT	TYP	N.DEC	ALTERNATE NAME
1	NAWDEX#	4	5	B	-	
5	TEMPERATURE	1	1	C	-	
6	SPEC_CONDUCT	1	1	C	-	
7	TURBIDITY	1	1	C	-	
8	COLOR	1	1	C	-	
9	ODOR	1	1	C	-	
10	PH	1	1	C	-	
11	SUSPD_SOLIDS	1	1	C	-	
12	PHY_RECMD_MTHDS	1	1	C	-	
13	PHY_BEGIN_YR	4	4	I	-	
17	PHY_END_YR	4	4	I	-	
21	PPHY_LST_UPDATE	4	4	I	-	
25	PHYSICAL_MED	1	1	C	-	
26	PHY_MODIFIER	80	80	C	-	
106	KEY-LOC	4	5	B	-	
	** REDEFINED ITEMS **					
5	PHY	101	101	C	-	
21	DATEC	4	4	C	-	

DATAFILE NAME: MET_DATA

21 ITEMS: STARTING IN POSITION 1

COL	ITEM NAME	WDTH	OPUT	TYP	N.DEC	ALTERNATE NAME
1	NAWDEX#	4	5	B	-	
5	MET_BEGIN_YR	4	4	I	-	
9	MET_END_YR	4	4	I	-	
13	MET_INTERRUPTED	1	1	C	-	
14	MET_RAINFALL	1	1	C	-	
15	MET_UNIT_RAINFAL	1	1	C	-	
16	MET_AIR_TEMPERAT	1	1	C	-	
17	MET_RSVD1	1	1	C	-	
18	MET_WIND_VELOCIT	1	1	C	-	
19	MET_RSVD2	1	1	C	-	
20	MET_RSVD3	1	1	C	-	
21	MET_RECMD_MTHDS	1	1	C	-	
22	MET_OTHER	12	12	C	-	
34	MET_TELEMETRY	1	1	C	-	
35	MET_LST_UPDATE	4	4	I	-	
39	MET_MEDIA	1	1	C	-	
40	MET_RECORDER_TYP	1	1	C	-	
41	MET_RECORDER_FRE	1	1	C	-	
42	MET_PN_CODE	1	1	C	-	
43	MET_MODIFIERS	80	80	C	-	
123	KEY-LOC	4	5	B	-	
	** REDEFINED ITEMS **					
5	MET	118	118	C	-	
35	DATEC	4	4	C	-	