

Beaver Valley Power Station

Unit 1/2

1/2-ODC-2.03

ODCM: Radiological Environmental Monitoring Program

Document Owner

Manager, Nuclear Environmental and Chemistry

| | |
|--------------------------|-------------------------|
| Revision Number | 6 |
| Level Of Use | General Skill Reference |
| Safety Related Procedure | Yes |
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1.0 PURPOSE

1.1 This procedure provides documentation of the Radiological Environmental Monitoring Program (REMP) as specified in the Radiological Branch Technical Position.^(3.1.1)

2.0 SCOPE

2.1 This procedure is applicable to liquid and gaseous effluents at Beaver Valley Power Station.

3.0 REFERENCES AND COMMITMENTS

3.1 References

- 3.1.1 Radiological Environmental Monitoring Program Requirements – Enclosing Branch Technical Position, Revision 1, (Generic Letter 79-65) 1979.
- 3.1.2 Regulatory Guide 1.109, Calculation of Annual Dose to Man From Routine Releases of Reactor Effluents For the Purpose of Evaluating Compliance with 10 CFR Part 50, Appendix I, Revision 1, 1977.
- 3.1.3 NUREG-1301, Offsite Dose Calculation Manual Guidance; Standard Radiological Effluent Controls for Pressurized Water Reactors (Generic Letter 89-01, Supplement No. 1).
- 3.1.4 Regulatory Guide 1.111, Methods For Estimating Atmospheric Transport and Dispersion of Gaseous Effluents in Routine Releases From Light-Water-Cooled Reactors, Revision 1, July 1977.
- 3.1.5 1/2-ADM-1640, Control of the Offsite Dose Calculation Manual
- 3.1.6 1/2-ADM-0100, Procedure Writers Guide
- 3.1.7 1/2-ADM-0101, Review and Approval of Documents
- 3.1.8 CR 04-00149, Radiation Protection Performance Committee Actions Items. CA-12 required obtaining GPS satellite data for use in the REMF.
- 3.1.9 CR 05-01169, Chemistry Action Plan for transition of RETS, REMF and ODCM. CA-17, revise procedure 1/2-ODC-2.03 to convert Radiation Protection responsibilities to Nuclear Environmental and Chemistry.
- 3.1.10 CR 05-01390, Include GPS data in 2004 REMF Report and related 1/2-ODC and 1/2-ENV procedures. CA-02, revise ODCM procedure 1/2-ODC-2.03 to include an update of REMF sample locations (using the GPS Satellite data).
- 3.1.11 CR 10-77489, Fixed incorrect sample designations for TLD #94 and #95; changed sample point designation #49 to #49A; clarified garden sampling requirements.
- 3.1.12 CA G203-2011-97516-001, Retire TLD Station #88 and add Station #88A.

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| | <p>3.1.13 CR G203-2011-02332, Inability to meet ODCM requirements for REMP milk sampling in 2011 and CA G203-2011-02332-1, Make changes to the ODCM.</p> <p>3.1.14 CR G203-2013-03554, Reduction in milk sample location, in 2013 Searight's Dairy farm stopped producing milk and permanently closed.</p> <p>3.1.15 10 CFR 72.104, Criteria for Radioactive Materials in Effluents and Direct Radiation from an ISFSI or MRS.</p> <p>3.2 <u>Commitments</u></p> <p>3.2.1 10 Code of Federal Regulations (CFR) 50 Appendix I</p> <p>4.0 <u>RECORDS AND FORMS</u></p> <p>4.1 <u>Records</u></p> <p>4.1.1 Calculation supporting ODCM changes shall be documented, as appropriate, by a retrievable document (e.g., letter or calculation package) with an appropriate RTL number.</p> <p>4.2 <u>Forms</u></p> <p>4.2.1 None.</p> <p>5.0 <u>PRECAUTIONS AND LIMITATIONS</u></p> <p>5.1 <u>Precautions</u></p> <p>5.1.1 None</p> <p>5.2 <u>Limitations</u></p> <p>5.2.1 None</p> <p>6.0 <u>ACCEPTANCE CRITERIA</u></p> <p>6.1 Changes to this procedure shall contain sufficient justification that the change will maintain the level of radioactive effluent control required by 10 CFR 20.1302, 40 CFR Part 190, 10 CFR 50.36a, 10 CFR 72.104 and Appendix I to 10 CFR 50, and not adversely impact the accuracy or reliability of effluent dose or alarm setpoint calculation.</p> <p>6.1.1 Changes to this procedure shall be prepared in accordance with 1/2-ADM-0100, PROCEDURE WRITER'S GUIDE ^(3.1.6) and 1/2-ADM-1640, CONTROL OF THE OFFSITE DOSE CALCULATION MANUAL. ^(3.1.5).</p> <p>6.1.2 Changes to this procedure shall be reviewed and approved in accordance with NOP-SS-3001, PROCEDURE REVIEW AND APPROVAL ^(3.1.7) and 1/2-ADM-1640^(3.1.5).</p> | | |

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7.0 PREREQUISITES

7.1 None

8.0 PROCEDURE

8.1 REMP Overview

8.1.1 Attachment A, Table 3.0-1 presents the exposure pathways and sampling and monitoring requirements for Beaver Valley Power Station Radiological Environmental Monitoring Program (REMP). The attachment provides details on site number, sector, distance, sample point description, sampling and collection frequency, analysis, and analysis frequency for various exposure pathways in the vicinity of the Beaver Valley Power Station.

8.1.2 Attachment B, Figures 3.0-1 through 3.0-6 show the location of the various sampling points.

8.2 Sampling and Analysis Program

8.2.1 Environmental samples shall be collected and analyzed according to Attachment A, Table 3.0-1. Analysis methods used shall be capable of achieving the detection capabilities in 1/2-ODC-3.03, Table 4.12-1.

8.2.2 Results of the radiological environmental monitoring are intended to supplement the results of the radiological effluent monitoring by verifying that the measurable concentrations of radioactive materials and levels of radiation are not higher than expected on the basis of the effluent measurements and modeling of the environmental exposure pathways.

8.2.2.1 The specified environmental monitoring program provides measurements of radiation and of radioactive materials in those exposure pathways and for those radionuclides which lead to the highest potential radiation exposures of individuals resulting from the station operation.

8.2.2.2 The initial radiological environmental monitoring program should be conducted for the first three (3) years of commercial operation (or other period corresponding to a maximum burnup in the initial core cycle). Following this period, program changes may be proposed based on operational experience.

8.2.3 Deviations from the required sampling schedule are acceptable if samples cannot be obtained because of hazardous conditions, seasonal unavailability, malfunction of automatic sampling equipment, and other legitimate reasons.

8.2.3.1 If samples cannot be obtained due to sampling equipment malfunction then every effort shall be made to complete corrective action to restore equipment prior to the end of the next sampling period.

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8.2.3.2 All Deviations from the sampling schedule shall be documented in the annual REMP report.

8.3 Crosscheck Program

8.3.1 Laboratories performing analysis for the purposes of the Radiological Environment Monitoring (REMP) program shall participate in the Environmental Protection Agency's (EPA's) Environmental Radioactivity Laboratory Intercomparisons Studies (Crosscheck) Program or equivalent program. Laboratories include those of the licensee and laboratories contracted by the licensee

8.3.1.1 Participation in the crosscheck program shall include all of the determinations (sample medium-radionuclide combination) that are offered by EPA and that also are included in the monitoring program.

8.3.1.2 The results of analysis of the crosscheck samples shall be included in the annual REMP report. The participants in the crosscheck program may provide their program code to the Nuclear Regulatory Commission (NRC) so that crosscheck data may be reviewed directly in lieu of submission in the annual REMP report.

8.3.1.3 If any results of the crosscheck program are outside the specified control limits, then the laboratory shall investigate the cause of the problem and take appropriate corrective action to resolve the discrepancy. The results of any investigation and corrective actions taken shall be included in the annual REMP report.

8.3.2 Participation in the crosscheck program is based upon the need to perform independent checks to validate precision and accuracy of the measurements of radioactive material in environmental sample matrices. This participation is part of the quality assurance program for environmental monitoring in order to demonstrate the results are reasonably valid.

8.4 Land Use Census Program

8.4.1 A census shall be conducted annually during the growing season to determine the location of the nearest milk animal, and nearest garden greater than fifty (50) square meters (500 sq. ft.) producing broad leaf vegetation in each of the sixteen (16) meteorological sectors within a distance of eight (8) km (5 miles).

8.4.1.1 For elevated releases as defined in Regulatory Guide 1.111^(3.1.4), the census shall also identify the locations of all milk animals, and gardens greater than fifty (50) square meters producing broad leaf vegetation out to a distance of five (5) km (3 miles) for each radial sector.

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- 8.4.1.2 If the land use census determines that the milk animals or gardens are present at a location which yields a calculated thyroid dose greater than those previously sampled, or if the land use census results in changes in the location used in Offsite Dose Calculation Manual (ODCM) dose calculations, then a written report shall be submitted to the Director of Operating Reactors, NRR (with a copy to the Director of the NRC Regional Office) within thirty (30) days identifying the new location (distance and direction).
- 8.4.1.3 Milk animal or garden locations resulting in higher calculated doses shall be added to the surveillance program as soon as practicable. The sampling location (excluding the control sample location) having the lowest calculated dose may then be dropped from the surveillance program at the end of the grazing or growing season during which the census was conducted. Any location from which milk can no longer be obtained may be dropped from the surveillance program after notifying the NRC in writing that they are no longer obtainable at that location.
- 8.4.1.4 The results of the land-use census shall be reported in the annual REMP report.
- 8.4.1.5 The census of milk animals and gardens producing broad leaf vegetation is based on the requirement in Appendix I of 10 CFR Part 50^(3.2.1) to "Identify changes in the use of unrestricted areas (e.g., for agricultural purposes) to permit modifications in monitoring programs for evaluating doses to individuals from principal pathways of exposure." The consumption of milk from animals grazing on contaminated pasture and of leafy vegetation contaminated by airborne radioiodine is a major potential source of exposure. Samples from milk animals are considered a better indicator of radioiodine in the environment than vegetation.
- 8.4.1.6 If the land use census reveals milk animals are not present or are unavailable for sampling then vegetation must be sampled.
- 8.4.1.7 The fifty (50) square meter garden, considering twenty (20) % used for growing broad leaf vegetation (i.e., similar to lettuce and cabbage), and a vegetation yield of two (2) kg/m², will produce the twenty-six (26) kg/yr assumed in Regulatory Guide 1.109^(3.1.2), for child consumption of leafy vegetation.

8.5 Direct Radiation Monitoring Program

- 8.5.1 The increase in the number of direct radiation stations is to better characterize the individual exposure (mrem) and population exposure (man-rem) in accordance with Criterion 64 - monitoring radioactivity releases, of 10 CFR Part 50, Appendix A. The NRC will place a similar amount of stations in the area between the two rings designated in 1/2-ODC-3.03, Table 3.12-1.

- END -

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ATTACHMENT A

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EXPOSURE PATHWAY AND SAMPLING REQUIREMENTS

TABLE 3.0-1
PROGRAM DETAILS

| <u>EXPOSURE PATHWAY AND/OR SAMPLE</u> | <u>SITE NO.</u> | <u>SECTOR</u> ¹ | <u>MILES</u> ² | <u>SAMPLE POINT DESCRIPTION</u> ³ | <u>SAMPLING AND COLLECTION FREQUENCY</u> | <u>TYPE AND FREQUENCY OF ANALYSES</u> |
|--|-----------------|----------------------------|-----------------------------------|--|---|---|
| 1. AIRBORNE Radioiodine and Particulates | 13 | 11 | 1.49 | Old Meyer Farm | Continuous sampler operation with collection at least weekly | Radioiodine Cartridge: I-131 analysis weekly. Particulate Sampler: Gross beta analysis following filter change ⁵ ; Gamma isotopic analysis on composite (by location) ----- Gamma dose quarterly. |
| | 30 | 4 | 0.43 | Shippingport (Cook's Ferry S.S.) | | |
| | 32 | 15 | 0.75 | Midland (North S.S.) | | |
| | 46.1 | 2/3 | 2.28 | Industry, McKeel's Service - Rt. 68 | | |
| | 48 | 10 | 16.40 | Weirton Water Tower, Collier Way | | |
| 2. DIRECT RADIATION | 10 | 3/4 | 0.94 | Shippingport Post Office | Continuous measurement with quarterly collection. | |
| | 13 | 11 | 1.49 | Old Meyer Farm | | |
| | 14 | 11 | 2.53 | Hookstown Boro | | |
| | 15 | 14 | 3.75 | Georgetown Post Office | | |
| | 27 | 7 | 6.14 | Brunton Farm | | |
| | 28 | 1 | 8.60 | Sherman Farm | | |
| | 29B | 3 | 7.97 | Friendship Ridge | | |
| | 30 | 4 | 0.43 | Shippingport (Cook's Ferry S.S.) | | |
| | 32 | 15 | 0.75 | Midland (North S.S.) | | |
| | 45 | 5 | 2.19 | Christian House Baptist Chapel - Rt. 18 | | |
| | 45.1 | 6 | 1.92 | Raccoon Twp., Kennedy's Corner | | |
| | 46 | 3 | 2.49 | Industry, Midway Drive | | |
| | 46.1 | 2/3 | 2.28 | Industry - McKeel's Service - Rt. 68 | | |
| | 47 | 14 | 4.88 | East Liverpool Water Dept. | | |
| | 48 | 10 | 16.40 | Weirton Water Tower, Collier Way | | |
| 51 | 5 | 8.00 | Aliquippa (Sheffield S.S.) | | | |
| 59 | 6 | 0.99 | 236 Green Hill Rd. | | | |
| 60 | 13 | 2.51 | 444 Hill Rd. | | | |
| 70 | 1 | 3.36 | 236 Engle Rd. | | | |
| 71 | 2 | 6.01 | Brighton Twp., First Western Bank | | | |

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EXPOSURE PATHWAY AND SAMPLING REQUIREMENTS

TABLE 3.0-1

PROGRAM DETAILS

| <u>EXPOSURE PATHWAY AND/OR SAMPLE</u> | <u>SITE NO.</u> | <u>SECTOR¹</u> | <u>MILES²</u> | <u>SAMPLE POINT DESCRIPTION³</u> | <u>SAMPLING AND COLLECTION FREQUENCY</u> | <u>TYPE AND FREQUENCY OF ANALYSES</u> |
|---|---------------------|---------------------------|--|---|--|---|
| 2. DIRECT RADIATION (continued) | 72 | 3 | 3.25 | Ohioview Lutheran Church - Rear | Continuous measurement with quarterly collection. | Gamma dose quarterly. |
| | 73 | 4 | 2.48 | 618 Squirrel Run Road | | |
| | 74 | 4 | 6.92 | 137 Poplar Ave. - CCBC | | |
| | 75 | 5 | 4.08 | 117 Holt Road | | |
| | 76 | 6 | 3.80 | Raccoon Elementary School | | |
| | 77 | 6 | 5.52 | 3614 Green Garden Road | | |
| | 78 | 7 | 2.72 | Raccoon Municipal Building | | |
| | 79 | 8 | 4.46 | 106 Rt. 151 - Ted McWilliams Auto Body | | |
| | 80 | 9 | 8.27 | Raccoon Park Office, Rt. 18 | | |
| | 81 | 9 | 3.69 | Millcreek United Presby. Church | | |
| | 82 | 9 | 6.99 | 2697 Rt. 18 | | |
| | 83 | 10 | 4.26 | 735 Mill Creek Road | | |
| | 84 | 11 | 8.35 | Hancock Co. Senior Center | | |
| | 85 | 12 | 5.73 | 2048 Rt. 30 | | |
| | 86 | 13 | 6.18 | 1090 Ohio Ave., E. Liverpool | | |
| | 87 | 14 | 7.04 | 50103 Calcutta Smith's Ferry Rd. | | |
| | 88A | 15 | 2.8 | Route 168, Midland Heights | | |
| | 89 | 15 | 4.72 | 488 Smith Ferry Rd., Ohioville | | |
| | 90 | 16 | 5.20 | 6286 Tuscarawras Rd. | | |
| | 91 | 2 | 3.89 | Pine Grove & Doyle Roads | | |
| 92 | 12 | 2.81 | Georgetown Rd. (Georgetown S.S.) | | | |
| 93 | 16 | 1.10 | 104 Linden - Sunrise Hills | | | |
| 94 | 10 | 2.37 | McCleary Road & Pole Cat Hollow Rd. | | | |
| 95 | 8 | 2.25 | 832 McCleary Road | | | |

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TABLE 3.0-1 (continued)

PROGRAM DETAILS

| <u>EXPOSURE PATHWAY AND/OR SAMPLE</u> | <u>SITE NO.</u> | <u>SECTOR¹</u> | <u>MILES²</u> | <u>SAMPLE POINT DESCRIPTION³</u> | <u>SAMPLING AND COLLECTION FREQUENCY</u> | <u>TYPE AND FREQUENCY OF ANALYSES</u> | |
|---|-------------------|---------------------------|--------------------------|--|--|---|--|
| 3. WATERBORNE a) Surface (River) | 49A | 3 | 4.92 | Upstream of Montgomery Dam ⁴ | Composite sample with sample collection at least monthly ⁶ . | Gamma isotopic analysis monthly; tritium analysis on composite (by location) quarterly. | |
| | 2.1 | 14 | 1.43 | Midland – ATI Allegheny Ludlam | | | |
| | b) Drinking Water | 4 | 15 | 1.26 | Midland Water Dept. | Composite sample with sample collection at least bi-weekly ⁶ . | I-131 analysis bi-weekly; gamma isotopic analysis on composite (by location) monthly; tritium analysis on composite (by location) quarterly. |
| | | 5 | 14 | 4.90 | East Liverpool Water Dept. | | |
| c) Ground Water | | | | None required ⁷ | | | |
| d) Shoreline Sediment | 2A | 12 | 0.31 | BVPS Outfall Vicinity | Semi-annually. | Gamma isotopic analysis semi-annually. | |
| 4. INGESTION a) Milk ¹¹ | 27 | 7 | 6.16 | Brunton's (large local dairy) | At least bi-weekly when animals are on pasture; at least monthly at other times. | Gamma isotopic and I-131 analysis on each sample. | |
| | *8 | -- | -- | | | | |
| | *8 | -- | -- | | | | |
| | *8 | -- | -- | | | | |
| | *8 | 10 | 10.48 | Windsheimer Farm | | | |
| | 96 | | | | | | |
| b) Fish | 2A | 12 | 0.31 | BVPS Outfall Vicinity | Semi-annually one sample of available species. | Gamma isotopic analysis. On edible portion. | |
| | 49A | 3 | 4.92 | Upstream of Montgomery Dam | | | |
| c) Food Products (Leafy Vegetables) ¹¹ | -- | -- | -- | Three (3) locations within 5 miles of BVPS (Shippingport, Industry, and Georgetown) ⁹ . | Annually at harvest time. ^{10, 11, 12} | Gamma isotopic and I-131 analysis on edible portion. | |
| | -- | -- | -- | 10, 11 One (1) control location | | | |
| | -- | -- | -- | (Weirton, W. V. area) ^{9, 10, 11} | | | |
| | -- | -- | -- | | | | |

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TABLE 3.0-1 (continued)
PROGRAM DETAILS

| <u>EXPOSURE PATHWAY AND/OR SAMPLE</u> | <u>SITE NO.</u> | <u>SECTOR¹</u> | <u>MILES²</u> | <u>SAMPLE POINT DESCRIPTION³</u> | <u>SAMPLING AND COLLECTION FREQUENCY</u> | <u>TYPE AND FREQUENCY OF ANALYSES</u> |
|---------------------------------------|-----------------|---------------------------|--------------------------|---|--|---------------------------------------|
|---------------------------------------|-----------------|---------------------------|--------------------------|---|--|---------------------------------------|

- ¹ Sector numbers 1-16 correspond to the 16 compass direction sectors N - NNW.
- ² Distance (in miles) is as measured from the midpoint between Unit 1 and Unit 2 Containment Buildings.
- ³ All Sample Points are in the Commonwealth of Pennsylvania and the states of Ohio and West Virginia. Maps showing the approximate locations of the Sample Points are provided as Attachment B, Figures 3.0-1 through 3.0-6 and Attachment C.
- ⁴ This is a Control Station and is presumed to be outside the influence of BVPS effluents.
- ⁵ A gamma isotopic analysis is to be performed on each sample when the gross beta activity is found to be greater than 10 times the mean of the Control Station sample.
- ⁶ Composite samples are obtained by collecting an aliquot at intervals not exceeding 2 hours. For the upstream surface water location site 49A, a weekly grab sample, composited each month is also acceptable.
- ⁷ Collection of Ground Water samples is not required as the hydraulic gradient or recharge properties are directed toward the river because of the high terrain in the river valley at the BVPS; thus, station effluents do not affect local wells and ground water sources in the area.
- ⁸ These Sample Points will vary and are chosen based upon calculated annual deposition factors (highest)..
- ⁹ Exact location may vary due to availability of food products.
- ¹⁰ When ODCM milk sample requirements are met, one type of broad leaf vegetation is to be sampled from the three (3) indicator locations and one (1) control location.
- ¹¹ When there are not enough milk sample locations available to meet the ODCM requirements, three (3) different types of broad leaf vegetation are to be sampled at each of two (2) indicator locations based on the highest predicted annual average ground D/Q (as determined from the previous year's Land Use Census results), in addition to those samples described in Note 10. Three (3) different types of broad leaf vegetation shall also be sampled at one (1) control location when in this condition.
- ¹² The primary sources of broad leaf vegetation are cabbage or lettuce. However, other acceptable substitutes are vegetables having leaves with large surface area, to be combined with the edible portion of the plant for analysis.

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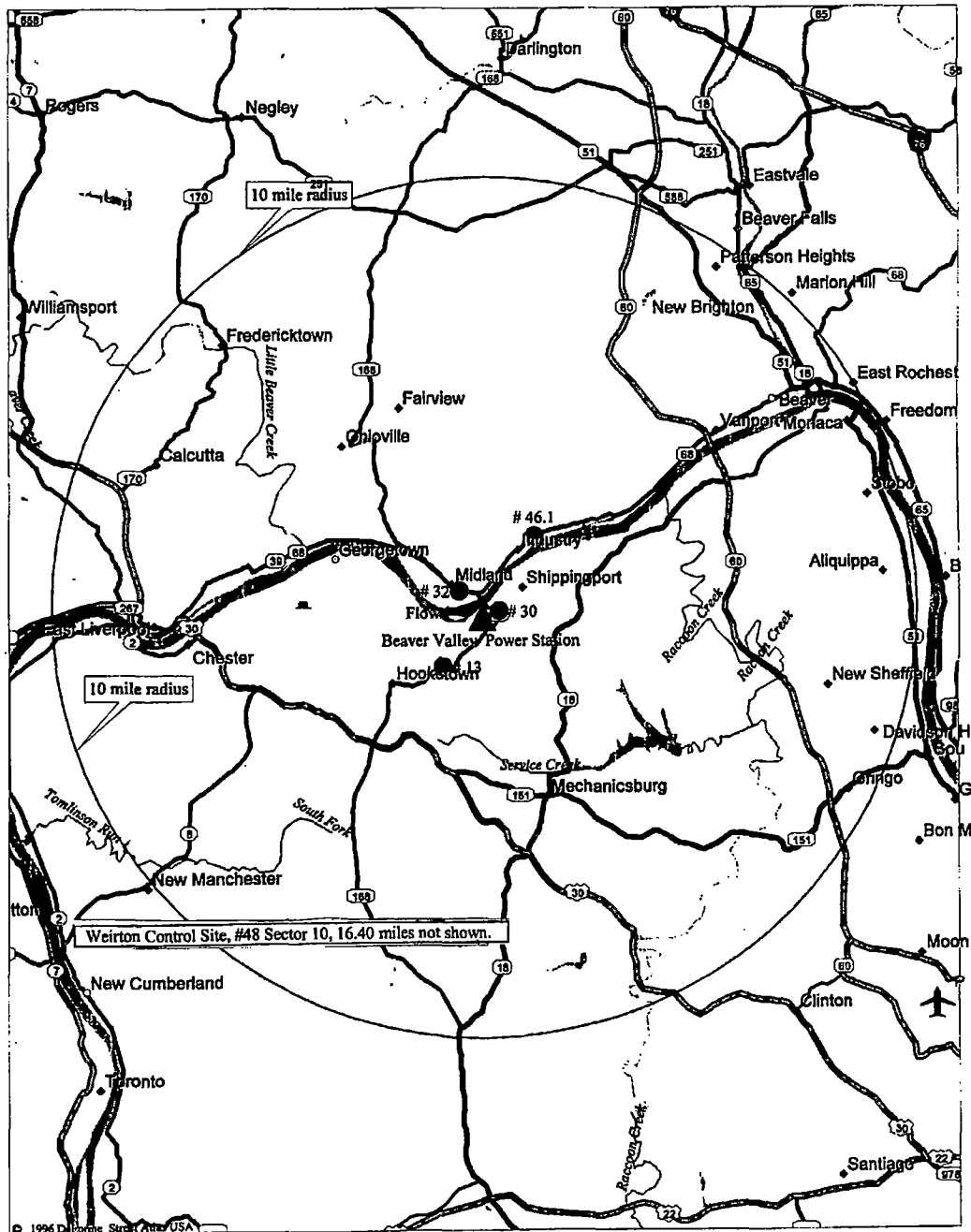
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LOCATION OF SAMPLING SITES

FIGURE 3.0-1
AIR SAMPLING LOCATIONS



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LOCATION OF SAMPLING SITES
FIGURE 3.0-1 (Continued)
AIR SAMPLING LOCATIONS

| Sector | Site # | Distance (miles) | Location |
|--------|--------|------------------|--------------------------------------|
| 11 | 13 | 1.49 | Old Meyer Farm |
| 4 | 30 | 0.43 | Shippingport (Cook's Ferry S.S.) |
| 15 | 32 | 0.75 | Midland (North S.S.) |
| 2/3 | 46.1 | 2.28 | Industry - McKeel's Service - Rt. 68 |
| 10 | 48 | 16.40 | Weirton Water Tower, Collier Way |

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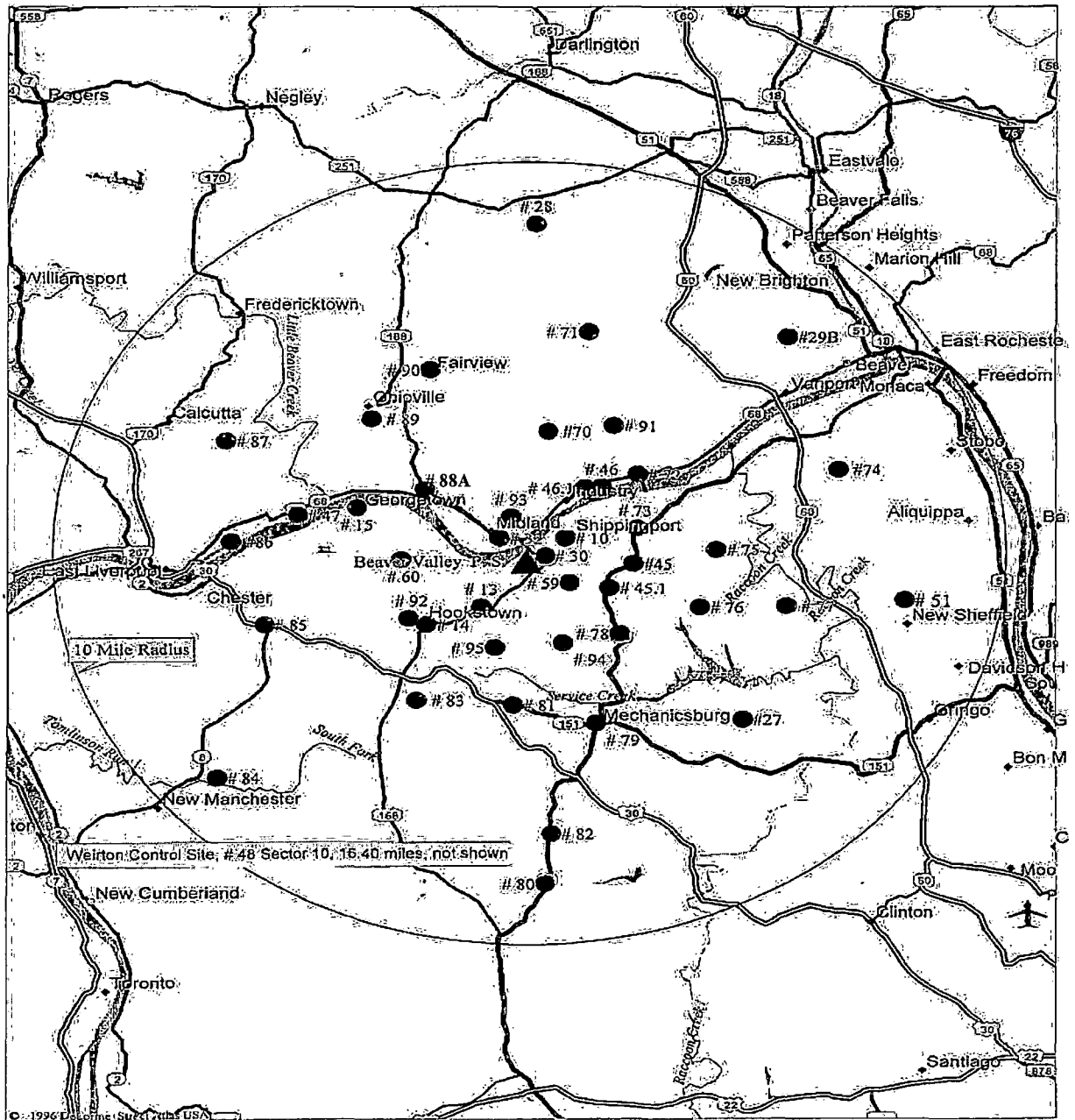
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LOCATION OF SAMPLING SITES FIGURE 3.0-2 TLD LOCATIONS



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LOCATION OF SAMPLING SITES
FIGURE 3.0-2 (continued)

TLD LOCATIONS

Southeast

| Sector | Site # | Distance (miles) | Location | Sector | Site # | Distance (miles) | Location |
|--------|--------|------------------|-------------------------------|--------|--------|------------------|---------------------------------------|
| 7 | 27 | 6.14 | Brunton Farm | 7 | 78 | 2.72 | Raccoon Municipal Bldg. |
| 6 | 45.1 | 1.92 | Raccoon Twp., Kennedy Corners | 8 | 79 | 4.46 | 106 Rt. 151- Ted McWilliams Auto Body |
| 5 | 51 | 8.00 | Aliquippa (Sheffield S.S.) | 9 | 80 | 8.27 | Raccoon Park Office, Rt. 18 |
| 6 | 59 | 0.99 | 236 Green Hill Road | 9 | 82 | 6.99 | 2697 Rt. 18 |
| 6 | 76 | 3.80 | Raccoon Elementary School | 8 | 94 | 2.25 | McCleary & Pole Cat Hollow Roads |
| 6 | 77 | 5.52 | 3614 Green Garden Road | | | | |

Northwest

| Sector | Site # | Distance (miles) | Location | Sector | Site # | Distance (miles) | Location |
|--------|--------|------------------|--------------------------------|--------|--------|------------------|----------------------------------|
| 14 | 15 | 3.75 | Georgetown Post Office | 14 | 87 | 7.04 | 50103 Calcutta Smith's Ferry Rd. |
| 15 | 32 | 0.75 | Midland (North S.S.) | 15 | 88A | 2.8 | Route 168; Midland Heights |
| 14 | 47 | 4.88 | E. Liverpool Water Dept. | 15 | 89 | 4.72 | 488 Smith Ferry Rd., Ohioville |
| 13 | 60 | 2.51 | 444 Hill Road | 16 | 90 | 5.20 | 6286 Tuscarawas Rd. |
| 13 | 86 | 6.18 | 1090 Ohio Avenue, E. Liverpool | 16 | 93 | 1.10 | 104 Linden - Sunrise Hills |

Northeast

| Sector | Site # | Distance (miles) | Location | Sector | Site # | Distance (miles) | Location |
|--------|--------|------------------|--|--------|--------|------------------|-----------------------------------|
| 3/4 | 10 | 0.94 | Shippingport Post Office | 1 | 70 | 3.36 | 236 Engle Rd. |
| 1 | 28 | 8.60 | Sherman Farm | 2 | 71 | 6.01 | Brighton Twp., First Western Bank |
| 3 | 29B | 7.97 | Friendship Ridge | 3 | 72 | 3.25 | Ohioview Luthern Church - Rear |
| 4 | 30 | 0.43 | Shippingport (Cook's Ferry S.S.) | 4 | 73 | 2.48 | 618 Squirrel Run Rd. |
| 5 | 45 | 2.19 | Christian House Baptist Chapel - Rt 18 | 4 | 74 | 6.92 | 137 Poplar Ave. - CCBC |
| 3 | 46 | 2.49 | Industry, Midway Dr. | 5 | 75 | 4.08 | 117 Holt Rd. |
| 2/3 | 46.1 | 2.28 | Industry - McKeel's Service - Rt 68 | 2 | 91 | 3.89 | Pine Grove Rd. & Doyle Rd. |

Southwest

| Sector | Site # | Distance (miles) | Location | Sector | Site # | Distance (miles) | Location |
|--------|--------|------------------|----------------------------------|--------|--------|------------------|----------------------------------|
| 11 | 13 | 1.49 | Old Meyer Farm | 11 | 84 | 8.35 | Hancock Co. Senior Center |
| 11 | 14 | 2.53 | Hookstown Boro | 12 | 85 | 5.73 | 2048 Rt. 30 |
| 10 | 48 | 16.40 | Weirton Water Tower, Collier Way | 12 | 92 | 2.81 | Georgetown Rd. (Georgetown S.S.) |
| 9 | 81 | 3.69 | Millcreek United Presby. Church | 10 | 95 | 2.37 | 832 McCleary Rd. |
| 10 | 83 | 4.26 | 735 Mill Creek Rd. | | | | |

Beaver Valley Power Station

Procedure Number:
1/2-ODC-2.03

Title:
ODCM: Radiological Environmental Monitoring Program

Unit:
1/2

Level Of Use:
General Skill Reference

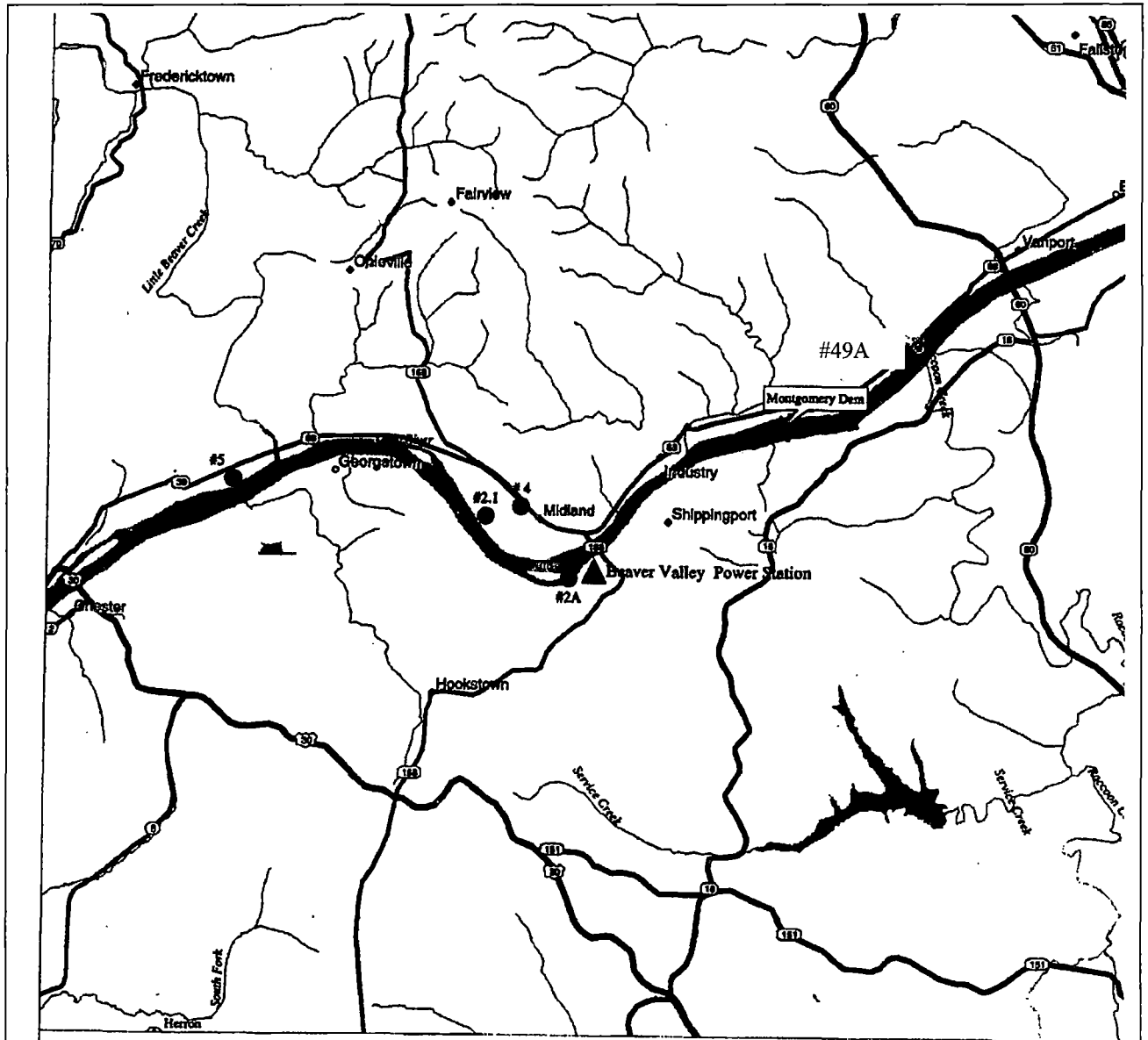
Revision:
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LOCATION OF SAMPLING SITES FIGURE 3.0-3

SHORELINE SEDIMENT, SURFACE WATER, AND DRINKING WATER SAMPLING LOCATIONS



| | | | |
|---|--|-----------------------------------|--|
| Beaver Valley Power Station | | Procedure Number: 1/2-ODC-2.03 | |
| Title: ODCM: Radiological Environmental Monitoring Program | | Unit: 1/2 | Level Of Use: General Skill Reference |
| | | Revision: 6 | Page Number: 17 of 23 |

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LOCATION OF SAMPLING SITES
FIGURE 3.0-3 (Continued)

SHORELINE SEDIMENT, SURFACE WATER, AND DRINKING WATER SAMPLING LOCATIONS

| Sample Type | Sector | Site # | Distance (miles) | Location |
|----------------|--------|--------|------------------|--------------------------------|
| Surface Water | 14 | 2.1 | 1.43 | Midland - ATI Allegheny Ludlam |
| Surface Water | 3 | 49A | 4.92 | Upstream of Montgomery Dam |
| Sediment | 12 | 2A | 0.31 | BVPS Outfall Vicinity |
| Sediment* | 3 | 49A | 4.93 | Upstream of Montgomery Dam |
| Drinking Water | 15 | 4 | 1.26 | Midland Water Dept. |
| Drinking Water | 14 | 5 | 4.90 | East Liverpool Water Dept. |

* Site #49A added – control site.

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LOCATION OF SAMPLING SITES FIGURE 3.0-4 (Continued) MILK SAMPLING LOCATIONS

| Sector | Site # | Distance (miles) | Location |
|--------|--------|------------------|------------------|
| 7 | 27 | 6.16 | Brunton's Dairy |
| 10** | 96 | 10.48 | Windsheimer Farm |
| | * | | |
| | * | | |
| | * | | |

*Three dairies based on highest deposition factors.

** Control Location.

Beaver Valley Power Station

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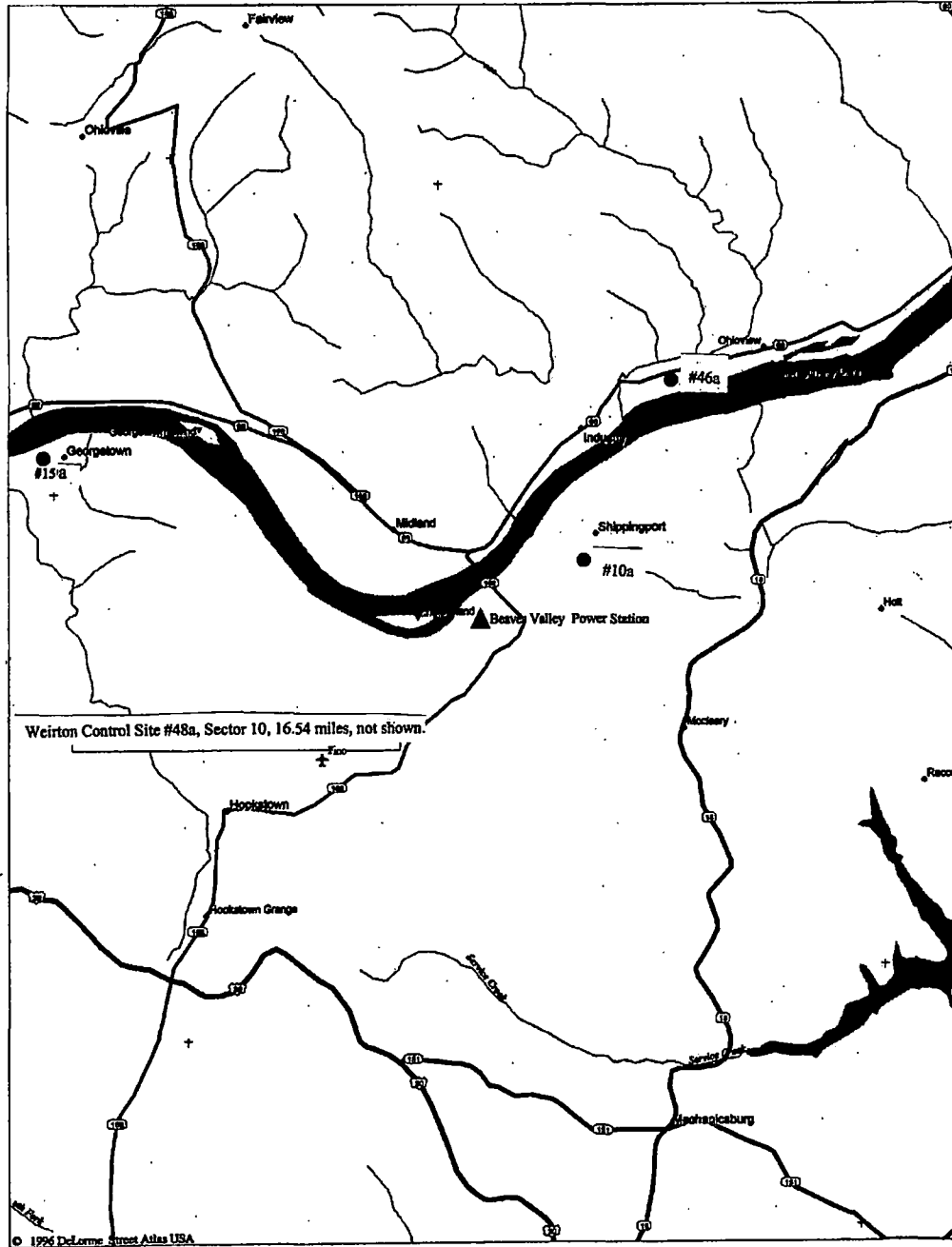
Level Of Use:
General Skill Reference

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LOCATION OF SAMPLING SITES FIGURE 3.0-5 FOODCROP SAMPLING LOCATIONS



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LOCATION OF SAMPLING SITES
FIGURE 3.0-5 (Continued)
FOODCROP SAMPLING LOCATIONS

| Site # | Description |
|--------|-------------------|
| 10* | Shippingport Boro |
| 15* | Georgetown Boro |
| 46* | Industry Boro |
| 48* | Weirton Area |

** Individual garden locations may change based upon availability. The requirements are met as long as one garden is sampled from each of these communities.*

Beaver Valley Power Station

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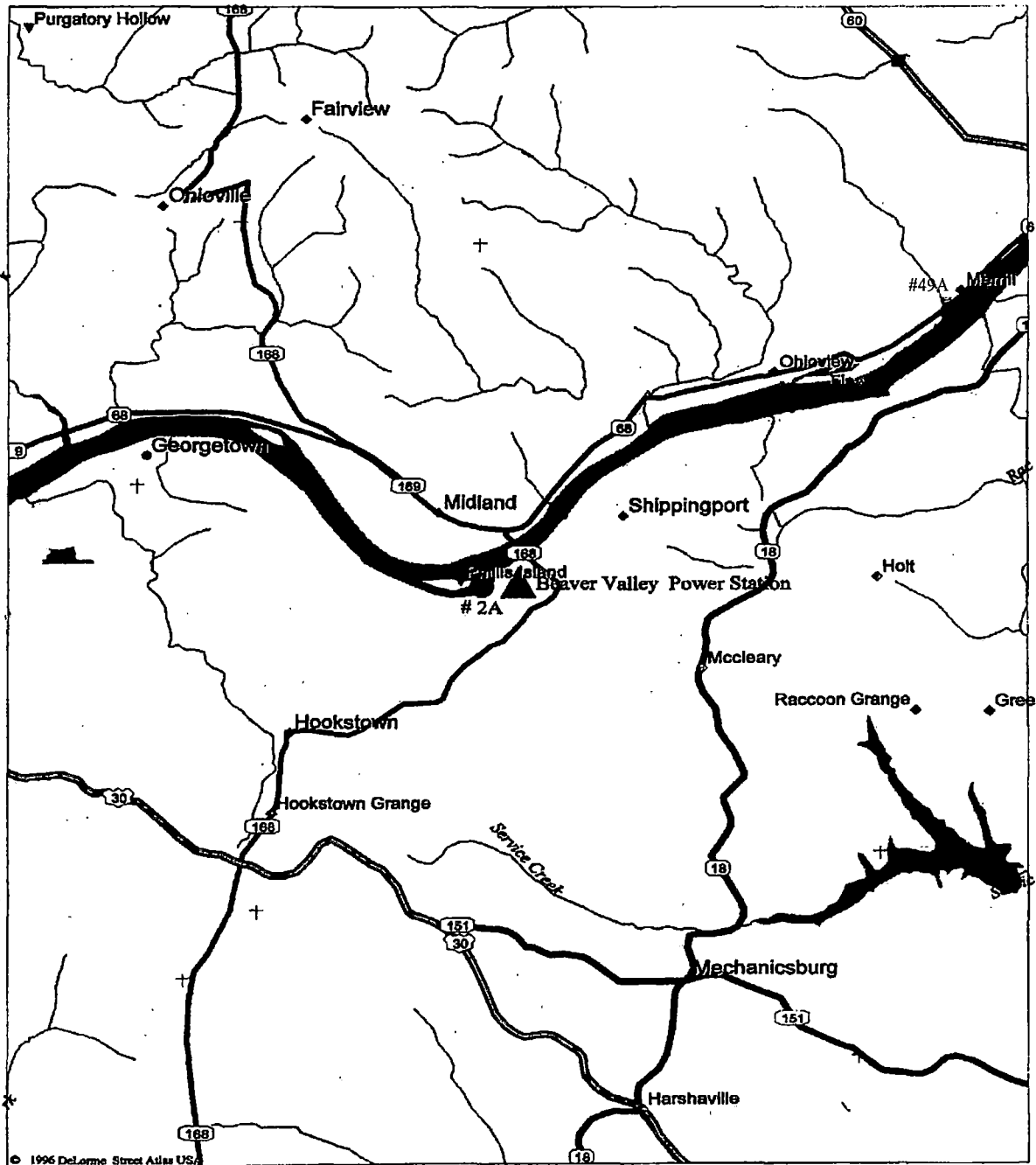
Level Of Use:
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LOCATION OF SAMPLING SITES FIGURE 3.0-6 FISH SAMPLING LOCATIONS



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ODCM: Radiological Environmental Monitoring Program

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LOCATION OF SAMPLING SITES
FIGURE 3.0-6 (Continued)
FISH SAMPLING LOCATIONS

| Sector | Site # | Distance (miles) | Location |
|--------|--------|------------------|----------------------------|
| 12 | 2A | 0.31 | BVPS Outfall Vicinity |
| 3 | 49A | 4.93 | Upstream of Montgomery Dam |