

QUALITY ASSURANCE/QUALITY CONTROL DOCUMENTATION SERIES	
TITLE	COLLECTION, PROCESSING, AND HANDLING OF 35 MM SLIDE FILM
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1.0 PURPOSE AND APPLICABILITY

This technical instruction (TI) describes the collection, processing, and handling procedures for 35 mm color slide film. This TI is referenced in SOP 4305, *Collection of Scene Monitoring Photographs and Film (IMPROVE Protocol)*, specifically describes:

- Tracking and documenting 35 mm film rolls.
- Identifying and labeling 35 mm color slides.
- Validating 35 mm slide quantity and quality.

2.0 RESPONSIBILITIES

2.1 PROJECT MANAGER

The project manager shall oversee all collection, processing, and handling procedures.

2.2 DATA COORDINATOR

The data coordinator shall:

- Supply the site operator with film and all necessary monitoring supplies.
- Verify that scheduled site visits are performed and notify the site operator if he/she fails to make a scheduled visit.
- Review all film documentation completed by the site operator for completeness and accuracy, and file all documentation and correspondence in the site-specific quality assurance database.
- Oversee film tracking.
- Review all film for quantity and quality.
- Resolve problems reported by the site operator and data technician.
- Verify that all Master Log documentation is complete and accurate.
- Determine collection and recovery statistics.

2.3 DATA TECHNICIAN

The data technician shall:

- Log all film rolls mailed to Air Resource Specialists, Inc. (ARS) from site operators.
- Ship all exposed film to the Kodalux laboratory for developing.
- Log all developed film returned from Kodalux processing.

- Complete Master Log documentation for each film roll.
- Identify and chronologically label all slides by site.
- Complete Visibility Monitoring Slide Logs.
- Report any noted documentation or data inconsistencies to the data coordinator.
- File all slides and supporting documentation.

2.4 SITE OPERATOR

The site operator shall:

- Report any noted inconsistencies upon site servicing and film changing to the data coordinator.
- Complete a Visibility Monitoring Status/Assessment Sheet and film canister label for each film roll.
- Mail exposed film rolls and accompanying documentation to ARS.

3.0 REQUIRED EQUIPMENT AND MATERIALS

The following equipment and materials are used to collect, document, and validate 35 mm color slide film:

- Kodachrome 64 36-exposure color slide film rolls
- Film canister labels
- Mailing envelopes
- Film processing mailers
- Visibility Monitoring Status/Assessment Sheets
- Master Logs
- Visibility Monitoring Slide Logs
- Light table
- Hand-held lens
- Alpha-numeric slide number stamps
- Polyethylene slide protector sheets
- Manila and hanging file folders
- 3-ring notebooks

4.0 METHODS

The major steps in the data collection, processing, handling, analysis, and archiving of 35 mm color slide film are presented in Figure 4-1. The specific steps described in this and related TIs are highlighted in this figure. Table 4-1 summarizes the collection, processing, and handling steps described in the following subsections of this TI.

This section includes the following three (3) major subsections:

- 4.1 Film Collection Procedures
- 4.2 Film Processing Procedures
- 4.3 Film Handling Procedures

4.1 FILM COLLECTION PROCEDURES

4.1.1 Film Purchase and Distribution

ARS purchases Kodachrome ASA 64, 36-exposure color slide film (from a single emulsion number) from a direct Kodalux distributor. Enough film is purchased to cover two consecutive monitoring seasons. The data coordinator ships a six-month (two seasons) supply of film to each monitoring site in film storage boxes. Specific film handling and storage instructions are attached to each film storage box (see Figure 4-2). Mailing envelopes and associated photographic monitoring supplies are also provided.

4.1.2 Field Documentation

Collection procedures for 35 mm color slide film include site servicing visits to perform film changes at the required interval, and the mailing of exposed film rolls and accompanying documentation by the site operator to ARS. When servicing a site, the operator loads a film roll into the camera and takes a photograph of the photo documentation board on the first exposure of the roll. The board contains:

- Monitoring site identification
- Date
- Time
- Film roll number (numbers are consecutive)

Each camera is also equipped with a databack that records the date and time that the photograph was taken on the lower right corner of each slide.

The operator also completes a film canister label and attaches it to the film canister. An example film canister label is provided as Figure 4-3. When the film is removed upon the next site servicing visit, the operator completes the information on the canister label, places the film in a padded envelope, and mails it, along with the Visibility Monitoring Status/Assessment Sheet, to ARS via first class mail.

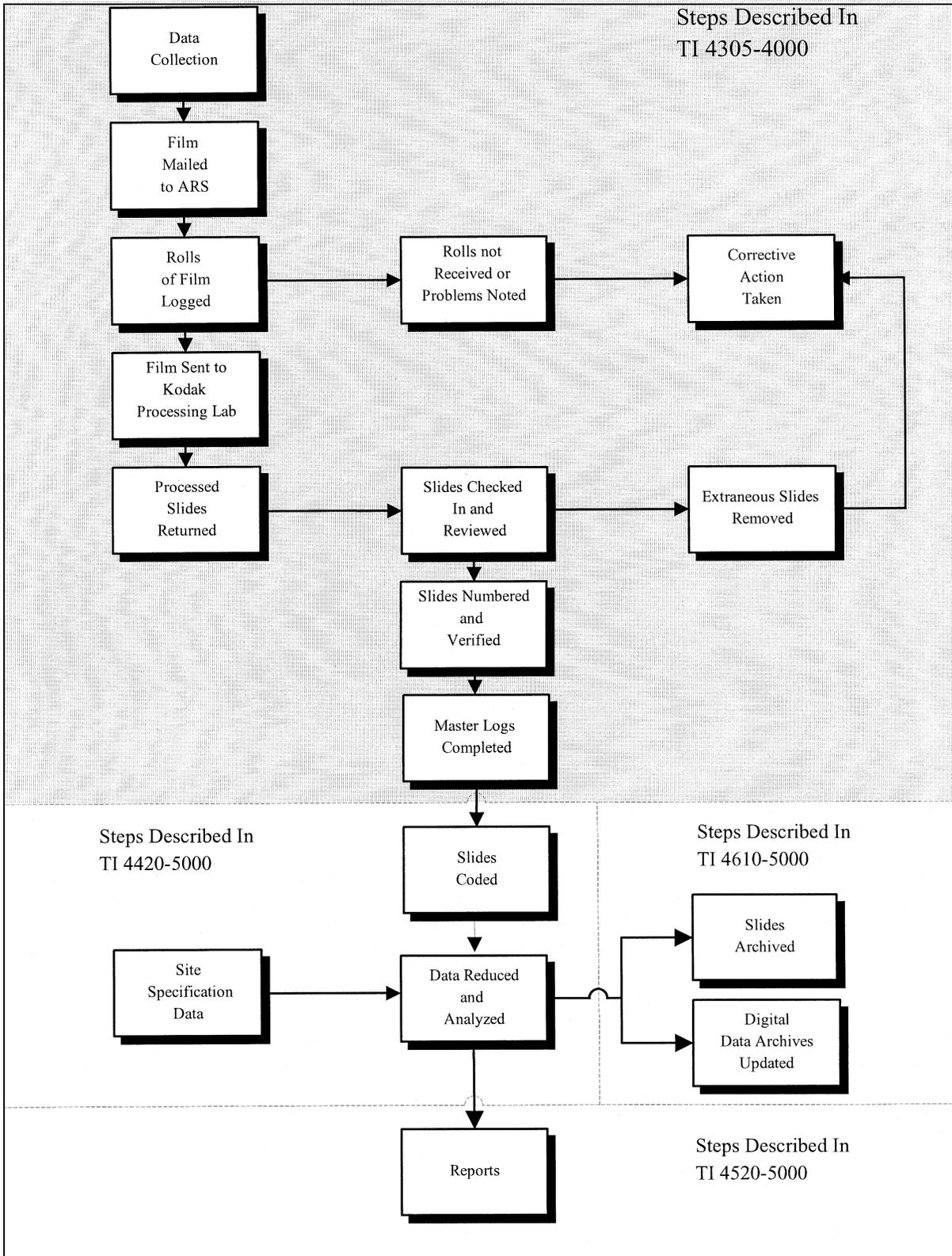


Figure 4-1. Major Steps in the Data Collection, Handling, Processing, Analysis, and Archiving of Photographic Data.

Table 4-1

Summary of Steps and Timing in the
Collection, Processing, and Handling of 35 mm Slide Film

Step	Time Path	Description
Data Collection	Overview	<p>A batch of Kodachrome 64, 36-exposure color slide film is purchased at 6-month intervals. Operational supplies and film are distributed to the sites every 6 months, along with film handling and storage instructions.</p> <p>Automatic cameras are usually programmed to take photographs of a selected vista 3 times a day at 0900, 1200, and 1500 local time. The film is removed for processing every 11 days. (For this example, it is assumed that the photographic data is collected on Tuesday, 2/18/94, and this data complete a 36-exposure roll of film.)</p>
Film Mailed to ARS	02/18/94	<p>The operator documents all pertinent camera operations and meteorological conditions on a Visibility Monitoring Status/Assessment Sheet and completes the film canister label. The film and status/assessment sheet are mailed to ARS via first class mail.</p>
Rolls of Film Logged	02/24/94	<p>Film that arrives from the field is immediately recorded on a site-specific Master Log according to the roll number and the time period the film documents. Any film not received in a timely manner or discrepancies noted on the status/assessment sheet are documented by site and roll number on the Master Log and corrective action is initiated.</p>
Film Sent to Kodak Processing Lab	02/25/94	<p>Film is sent by courier to the Kodalux processing laboratory in Dallas.</p>
Process Slides Returned	02/28/94	<p>Receipt of the developed slides from Kodalux is recorded on the site Master Log.</p>
Slides Checked-In and Reviewed	03/02/94	<p>Extraneous slides (if any) are removed and documentation and target photographs are arranged in polyethylene sheets by date and time. Slides are reviewed to verify that the vista alignment is correct and that no equipment or exposure inconsistencies exist. Any discrepancies are documented by site and roll number on the Master Log and corrective action is initiated by the data coordinator.</p>
Slides Numbered	03/02/94	<p>Following verification of slide arrangement, each slide is numbered sequentially and stamped with the four-letter site code. A Visibility Monitoring Slide Log is completed with slide numbers and corresponding dates and times. The slide set (roll) and slide log are placed in a manila folder.</p>
Slides Verified	03/05/94	<p>Each set of slides and accompanying log is reviewed once more by the data coordinator. Preliminary data collection statistics and corrective actions taken (if any) are documented on the Master Log. The slide set is then filed according to site name and monitoring season.</p>
Final Collection Statistics Prepared	05/01/94	<p>Final Master Logs are prepared by the data coordinator at the completion of each season to summarize the data collected and thoroughly document data recovery and observed equipment operation discrepancies, as well as actions taken to resolve such discrepancies.</p>

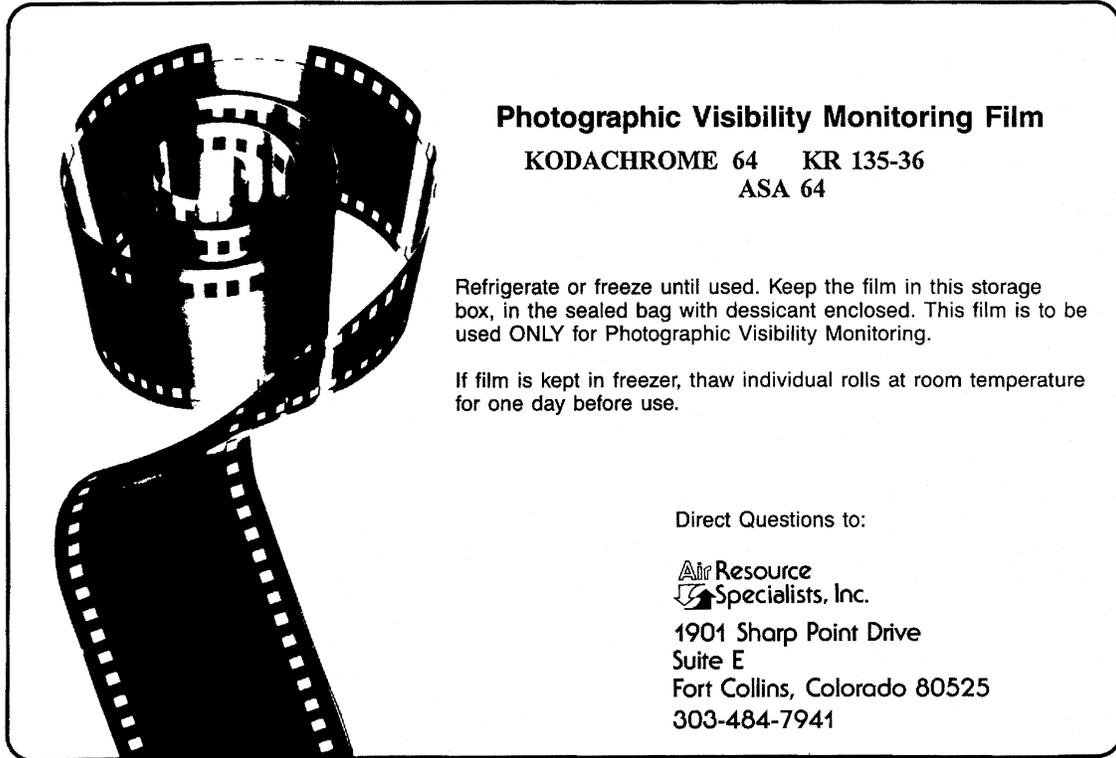


Figure 4-2. On-Site Film Handling and Storage Instructions Attached to the Film Storage Box.

LOC: _____	ROLL # _____
DATE ON: _____	TIME ON: _____
DATE OFF: _____	TIME OFF: _____
EMULSION #: _____	
EXPIRATION DATE: _____	

Figure 4-3. Example Film Canister Label.

An example Visibility Monitoring Status/Assessment Sheet is provided as Figure 4-4. Film should be sent immediately to:

Air Resource Specialists, Inc.
1901 Sharp Point Drive Suite E
Fort Collins, CO 80525
Attention: Photographic Data Coordinator

Further details on site servicing procedures and site operator-related film collection procedures can be found in the camera-specific technical instruction for routine site operator maintenance of 35 mm automatic camera systems (TIs 4120-3100, 4120-3110, 4120-3120, 4120-3130, and 4120-3140).

4.2 FILM PROCESSING PROCEDURES

4.2.1 Master Log

Completion of the Master Log is essential to ensure quality film documentation. Information recorded on the Master Log is partially derived from site operator documentation; the remainder of the information is recorded for tracking purposes during film processing and film handling. An example Master Log is provided as Figure 4-5. The following information is entered on the Master Log:

- Season.
- Site name and abbreviation.
- Contact person (site operators).
- ROLL # - Consecutive, chronological film roll number by site.
- LOG - *Yes* if a status/assessment sheet was completed and accompanies the film roll, *no* if a status/assessment sheet was not sent with the film roll.
- SENT PROC - Date when the film was received at ARS from the site and sent to Kodak for processing.
- MAIL # - Film processing mailer number for film tracking during processing and shipping.
- EMUL # - Film emulsion number as recorded on the film canister label.
- BACK PROC - Date when the film was received at ARS from Kodak after being processed.
- SLIDE # - Beginning and ending slide numbers of the properly sequenced set for the monitoring period.
- # GOOD - The actual number of slides that are usable for qualitative analysis.

Location _____ Roll No. _____
 Operator _____

**AUTOMATIC CAMERA
 VISIBILITY MONITORING STATUS/ASSESSMENT SHEET**

FILM LOADED

Today's Date _____ Time _____

Yes No

- Batteries tested
- Documentation photograph taken
- Camera main switch (circle one)
 A(EOS) Auto (OM2S) Off (OM2N)
 On(137MA) (167MT) ON(PZ-20)
- Aperture F8.0
- ISO/ASA 64 (137MA ASA 100)
- All other camera settings correct
 (refer to 35 mm camera checklist)
- Lens focus on infinity
- Databack display correct
- Timer clocks and alarms verified
- Camera/timer cable secure
- Camera alignment correct
- Film advancing properly
- Enclosure door locked and
 door seal clamps tightened

FILM REMOVED

Today's Date _____ Time _____

Yes No

- Camera found in proper operation
- Camera alignment correct
- Film advanced as expected
 exposure count on _____
- Camera main switch (circle one)
 A(EOS) Auto(OM2S) Off(OM2N)
 On(137MA) (167MT)ON(PZ-20)
- Aperture F8.0
- ISO/ASA 64 (137MA ASA 100)
- All other camera settings correct
 (refer to 35 mm camera checklist)
- Camera/timer cable secure
- Timer found in proper condition
- Film rewind correctly
- Film canister properly labeled

DESCRIBE WEATHER AND VISIBILITY CONDITIONS for the duration of this roll _____

Current % Cloud Cover _____ Temperature _____
 Now Max Min

COMMENTS/ACTION TAKEN _____

SUPPLIES NEEDED _____

Mail white copy and 35 mm film to:

**Air Resource
 Specialists, Inc.**
 1901 Sharp Point Drive, Suite E
 Fort Collins, CO 80525
 Phone: 970-484-7941
 Fax: 970-484-3423

Figure 4-4. Example Automatic Camera Visibility Monitoring Status/Assessment Sheet.

- # REC - The actual number of slides taken, recorded after review and validation of the film.
- # POS - Number of slides possible on the film roll, noted by the on/off dates and times the site operator recorded on the status/assessment sheet.
- DATE LOG - The beginning and ending dates of the slides contained on the film roll, as noted by the site operator on the status/assessment sheet and verified by review of the slides.
- TIME LOG - The beginning and ending times of the slides contained on the film roll, as noted by the site operator on the status/assessment sheet and verified by the review of the slides.
- CORRESPONDENCE - Notation and description of correspondence or communication pertaining to each specific film roll.
- PROBLEMS - Notation and description of problems pertaining to each specific film roll.
- EQUIPMENT CHANGE - A notation of the type and date replacement changes or modifications were made at the site, if applicable.
- SUPPLIES MAILED - A notation of the type, volume, and date supplies were sent to the site, if applicable.

The data coordinator verifies that all Master Log documentation is complete and accurate. Master Logs and any accompanying documentation are chronologically stored in 3-ring notebooks by site.

4.2.2 Visibility Monitoring Status/Assessment Sheet Review

The Visibility Monitoring Status/Assessment Sheet is thoroughly reviewed by the ARS data technician and data coordinator to verify proper camera operations and note any weather anomalies or requested operational supplies. Any discrepancies are documented by site and roll number on the Master Log and corrective action is initiated. Any requested monitoring supplies or photographic components are shipped within 24 hours, provided sufficient backup equipment/supplies are available.

4.2.3 Film Processing

After each exposed film roll has been identified and recorded on the Master Log, it is placed in an individual 35 mm film processing mailer that has a specific identification number (also recorded on the site Master Log). Site abbreviation and film roll number are noted on the mailer for further identification. Film mailers are shipped via courier to the Kodak processing laboratory in Dallas twice a week.

The developed film is returned via courier to ARS in three to four days. If the film is not returned within seven days, ARS calls the courier to verify the arrival of the shipment, and a trace is made if any discrepancies in shipping/receiving dates are discovered.

4.3 FILM HANDLING PROCEDURES

4.3.1 Slide Check-In and Arrangement

Receipt of the developed slides is recorded on the site Master Log. All slides are visually reviewed by the data technician on a light table. Extraneous slides (if any) are removed, and documentation and target photographs are arranged in polyethylene protector sheets by date and time. Only slides that represent the standard date and time sequence of the selected vista or those taken purposely to document specific visibility events or site conditions are kept. The documentation board photograph is placed in upper left corner of the protector sheet at the beginning of each roll of film.

4.3.2 Slide Verification

Slides are further reviewed by the data technician and data coordinator to verify that:

- The vista alignment is correct.
- The number of slides corresponds to the data collection period noted on the film canister label.
- Databack date and time are recorded on the film.
- Slides are arranged in proper order.
- No exposure inconsistencies exist.
- The vista focus is correct.

All photographs are considered usable (good) for further qualitative analyses, except for:

- Supplemental visibility photographs.
- Out-of-alignment photographs (e.g., the target is not in the view).
- Extremely under- or overexposed photographs.
- Out-of-focus photographs; distinct features cannot be identified.
- Photographs taken through a fogged or icy shelter window.

Any discrepancies found are documented by site and roll number on the Master Log and corrective action is initiated by the data coordinator. (Refer to camera-specific emergency maintenance procedure TIs.) Any problems or interesting events observed on the slides are reviewed with the project manager. Qualitative review procedures are detailed in TI 4420-5000, *Qualitative Scene Coding and Data Reduction of 35 mm Color Slides*.

4.3.3 Slide Numbering and Filing

Following verification of slide arrangement, each slide is numbered sequentially and stamped with the four-letter site code by the data technician. A Visibility Monitoring Slide Log is also completed to provide a quick reference, hard copy record of the slide numbers, dates, and times captured on each roll of film (see Figure 4-6). Slide-specific comments can also be included on the log if appropriate. The slide set is placed in a manila folder along with the completed Visibility Monitoring Slide Log and the associated status/assessment sheet. The folder is labeled with the site abbreviation and roll number.

Each set of slides and accompanying log is reviewed once more by the data coordinator. After the review the folder is labeled with the slide numbers and corresponding dates. Each file is then chronologically stored in a hanging file folder by site and season. Seasons are defined as:

Winter	(December, January, and February)
Spring	(March, April, and May)
Summer	(June, July, and August)
Fall	(September, October, and November)

Refer to TI 4610-5000, *35 mm Photographic Slide Archives* for detailed archive procedures.

4.3.4 Final Collection and Data Recovery Statistics

Master Logs are completed and verified by the data coordinator at the end of each season to summarize the data collected at each site and to thoroughly document data recovery and observed equipment operation discrepancies, as well as actions taken to resolve such discrepancies. The completed Master Logs reflect final collection statistics for the period.

Data recovery statistics are compiled seasonally by the data coordinator. The primary data collection statistic calculated is:

$$\% \text{ Overall Data Recovery} = (\# \text{ REC} / \# \text{ POS})$$

Completed Master Logs are stored chronologically by site in 3-ring notebooks.

QUALITY ASSURANCE/QUALITY CONTROL DOCUMENTATION SERIES

TITLE **COLLECTION, PROCESSING, AND HANDLING OF 8 MM TIME-LAPSE
MOVIE FILM**

TYPE **TECHNICAL INSTRUCTION**

NUMBER **4305-4003**

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1.0 PURPOSE AND APPLICABILITY

This technical instruction (TI) describes the collection, processing, and handling procedures for 8 mm time-lapse movie film. This TI is referenced in SOP 4305, *Collection of Scene Monitoring Photographs and Film (IMPROVE Protocol)*, specifically describes:

- Tracking and documenting 8 mm film rolls.
- Identifying and labeling 8 mm film.
- Validating 8 mm film quantity and quality.

2.0 RESPONSIBILITIES

2.1 PROJECT MANAGER

The project manager shall oversee all collection, processing, and handling procedures.

2.2 DATA COORDINATOR

The data coordinator shall:

- Supply the site operator with film and all necessary monitoring supplies.
- Verify that scheduled site visits are performed and notify the site operator if he/she fails to make a scheduled visit.
- Review all film documentation completed by the site operator for completeness and accuracy, and file all documentation and correspondence in site-specific notebooks.
- Oversee film tracking.
- Review all film for quantity and quality.
- Resolve problems reported by the site operator and data technician.
- Complete Master Log documentation for each film roll.

2.3 DATA TECHNICIAN

The data technician shall:

- Log all film rolls mailed to Air Resource Specialists, Inc. (ARS) from site operators.
- Ship all exposed film to the Kodak laboratory for developing.
- Log all developed film returned from Kodak processing.
- Label and chronologically identify all film rolls by site.
- File all film rolls and supporting documentation.

2.4 SITE OPERATOR

The site operator shall:

- Report any noted inconsistencies upon site servicing and film changing to the data coordinator.
- Complete a Visibility Monitoring Status/Assessment Sheet and film cartridge label for each film roll.
- Mail exposed film rolls and accompanying documentation to ARS.

3.0 REQUIRED EQUIPMENT AND MATERIALS

The following equipment and materials are used to collect, document, and validate 8 mm time-lapse film rolls:

- Kodachrome Super-8 color movie film
- Film cartridge labels
- Mailing envelopes
- Film processing mailers
- Visibility Monitoring Status/Assessment Sheets
- Master Logs
- 8 mm movie projector
- 3-ring notebooks

4.0 METHODS

This section includes the following three (3) major subsections:

- 4.1 Film Collection Procedures
- 4.2 Film Processing Procedures
- 4.3 Film Handling Procedures

4.1 FILM COLLECTION PROCEDURES

4.1.1 Film Purchase and Distribution

ARS purchases Kodachrome Super-8 color movie film from a direct Kodalux distributor. Enough film is purchased to cover two consecutive monitoring seasons. The data coordinator ships a six-month (two seasons) supply of film to each monitoring site along with mailing envelopes and associated photographic monitoring supplies.

4.1.2 Field Documentation

Collection procedures for 8 mm film include site servicing visits to perform film changes at the required interval, and the mailing of exposed film cartridges and accompanying documentation by the site operator to ARS. When servicing a site, the operator completes a film cartridge label and attaches it to the film cartridge before loading the film into the camera. An example film cartridge label is provided as Figure 4-1. When the film is removed upon the next site servicing visit, the operator completes the information on the cartridge label, places the film in a padded envelope, and mails it, along with the Visibility Monitoring Status/Assessment Sheet, to ARS via first class mail.

LOC: _____	ROLL # _____
DATE ON: _____	TIME ON: _____
DATE OFF: _____	TIME OFF: _____
EMULSION #: _____	
EXPIRATION DATE: _____	

Figure 4-1. Example Film Cartridge Label.

The format of the Visibility Monitoring Status/Assessment Sheet will vary slightly according to camera type. Examples of the Visibility Monitoring Status/Assessment sheets are provided as Figures 4-2 and 4-3. Film should be sent immediately to:

Air Resource Specialists, Inc.
1901 Sharp Point Drive Suite E
Fort Collins, CO 80525
Attention: Photographic Data Coordinator

Further details on site servicing procedures and film collection procedures can be found in TI 4120-3200, *Routine Site Operator Maintenance Procedures for 8 mm Automatic Camera System - Minolta XL-401/601*, and TI 4120-3210, *Routine Site Operator Maintenance Procedures for 8 mm Automatic Camera System - Minolta D-12*.

4.2 FILM PROCESSING PROCEDURES

4.2.1 Master Log

Completion of the Master Log is essential to ensure quality film documentation. Information recorded on the Master Log is partially derived from site operator documentation; the remainder of the information is recorded for tracking purposes during film processing and film handling. An example Master Log is provided as Figure 4-4. The following information is entered on the Master Log:

- Season.
- Site name and abbreviation.

Location _____

**TIME-LAPSE CAMERA VISIBILITY MONITORING
STATUS/ASSESSMENT SHEET**

Today's Date _____ Time _____ Operator _____

Roll # _____ Date On _____ Time On _____

Temperature _____ % Cloud Cover _____
(F) Now Max Min

Describe General
Weather Conditions: _____

Yes	No	
_____	_____	Monitoring target visible
_____	_____	Camera found in proper condition
_____	_____	Timer found in proper condition
_____	_____	Film advanced as expected
_____	_____	Film changed and film canister properly labeled
_____	_____	Lens and window clean
_____	_____	Settings verified
		Normal/Macro Switch - NORMAL
		Aperture Switch - AUTO
		Filter Switch - DAYLIGHT
		Function Switch - INTERVALOMETER
		Interval Adjustment - 60-second position (recommended)
_____	_____	Camera alignment correct
_____	_____	Operating Switch ON

COMMENTS/ACTION TAKEN _____

Supplies Needed: _____

Enclose this Status/Assessment Sheet with the 8 mm movie film and send to:



Figure 4-2. Time-Lapse Camera Visibility Monitoring Status/Assessment Sheet
For All 8 mm Camera Systems (except Minolta D-12).

Location _____

**TIME-LAPSE CAMERA VISIBILITY MONITORING
STATUS/ASSESSMENT SHEET
FOR MINOLTA D-12**

Today's Date _____ Time _____ Operator _____

Roll # _____ Date On _____ Time On _____

Temperature _____ % Cloud Cover _____
(F) Now Max Min

Describe General
Weather Conditions: _____

Yes	No	
_____	_____	Monitoring target visible
_____	_____	Camera found in proper condition
_____	_____	Timer found in proper condition
_____	_____	Film advanced as expected
_____	_____	Film changed and film canister properly labeled
_____	_____	Lens and window clean
_____	_____	Settings verified

Normal/Macro Switch	- N (Normal)
Aperture Control Selector	- A (Auto)
Manual Filter Switch	- No lamp symbol (Daylight position)
Auto Exposure Adjustment Dial	- Red mark (no adjustment)
Operation/Effect Selector	- N (Normal)
Frame speed dial	- S.F. (single frame)
Battery Master Switch	- OFF
Intervalometer	- ON
Interval Adjustment	- 60-second position (recommended)

_____	_____	Camera alignment correct
_____	_____	Operating Switch ON

COMMENTS/ACTION TAKEN _____

Supplies Needed: _____

Enclose this Status/Assessment Sheet with the 8 mm movie film and send to:

 **Air Resource
Specialists, Inc.**
1901 Sharp Point Drive, Suite E
Fort Collins, CO 80525
Phone: 970-484-7941
Fax: 970-484-3423

Figure 4-3. Time-Lapse Camera Visibility Monitoring Status/Assessment Sheet
For Minolta D-12 8 mm Camera System.

- Contact person (site operators).
- ROLL # - Consecutive, chronological film roll number by site.
- LOG - *Yes* if a status/assessment sheet was completed and accompanies the film roll, *no* if a status/assessment sheet was not sent with the film roll.
- SENT PROC - Date when the film was received at ARS from the site and sent to Kodalux for processing.
- MAILER # - Film processing mailer number for film tracking during processing and shipping.
- BACK PROC - Date when the film was received at ARS from Kodalux after being processed.
- # POSS - Number of days possible the film could contain, noted by the on/off dates and times the site operator recorded on the status/assessment sheet.
- # REC'D - The actual number of days captured (received) on the film, recorded after review and validation of the film.
- DATE LOGGED - The beginning and ending dates of the photographs contained on the film roll, as noted by the site operator on the status/assessment sheet and verified by review of the film.
- TIME LOGGED - The beginning and ending times of the photographs contained on the film roll, as noted by the site operator on the status/assessment sheet and verified by review and validation of the film.
- PROBLEMS - Notation and description of problems pertaining to each specific film roll.
- EQUIPMENT CHANGE - A notation of the type and date replacement changes or modifications were made at the site, if applicable.
- SUPPLIES MAILED - A notation of the type, volume, and date supplies were sent to the site, if applicable.

Master Logs and accompanying documentation are chronologically stored in 3-ring notebooks by site.

4.2.2 Visibility Monitoring Status/Assessment Sheet Review

The Visibility Monitoring Status/Assessment Sheet is thoroughly reviewed by the ARS data coordinator to verify proper camera operations and note any weather anomalies or requested operational supplies. Any discrepancies are documented by site and roll number on the Master Log and corrective action is initiated. Any requested monitoring supplies or photographic components are shipped within 24 hours, provided sufficient backup equipment/supplies are available.

4.2.3 Film Processing

After each exposed film roll has been identified and recorded on the Master Log, it is placed in an individual 8 mm film processing mailer that has a specific identification number (also recorded on the site Master Log). Site abbreviation and film roll number are noted on the mailer for further identification. Film mailers are shipped via courier to the Kodak processing laboratory in Dallas twice a week.

The developed film is returned via courier to ARS in three to four days. If the film is not returned within seven days, ARS calls the courier to verify the arrival of the shipment, and a trace is made if any discrepancies in shipping/receiving dates are discovered.

4.3 FILM HANDLING PROCEDURES

4.3.1 Quality Assurance Review

The quality assurance review begins with a visual review of the developed 8 mm film by the data coordinator. Film is reviewed for camera and system component operation, exposure quality, frame alignment and focus, exposure timing (including on/off times and exposure interval), film processing problems, the detection of unusual visual events or anomalies, and dirty or obscured shelter windows (due to snowfall, dirt, foreign objects, etc.). Any noted problems or inconsistencies observed on the film are recorded on the Master Log.

4.3.2 Film Verification

Any problems or interesting events observed on the film are again reviewed with the project manager. If appropriate, the data coordinator discusses corrective action with the site operator or sends replacement equipment to the site. Refer to TI 4120-3400, *Troubleshooting and Emergency Maintenance Procedures for Time-Lapse Camera System - Minolta XL601*, or TI 4120-3410, *Troubleshooting and Emergency Maintenance Procedures for Time-Lapse Camera System - Minolta D-12*. Qualitative review procedures are detailed in TI 4420-5010, *Qualitative 8 mm Time-Lapse Movie Film Review*.

4.3.3 Film Labeling and Filing

After each 8 mm film roll is processed by Kodak and received at ARS, it is labeled by site, roll number, and beginning and ending dates. This labeling is written on both the film roll and on the end of the film box. This information is also entered on the Master Log. The labeled film rolls are placed chronologically in site-specific storage boxes within storage cabinets. All supporting documentation including the Master Logs, Visibility Monitoring Status/Assessment Sheets, and other notes or important observations are kept in 3-ring notebooks by site, and filed in the storage cabinets alongside the film rolls. Refer to TI 4610-5010, *8 mm Time-Lapse Movie Archives*, for detailed archive procedures.

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1.0 PURPOSE AND APPLICABILITY

This technical instruction (TI) describes the collection, processing, and handling procedures for SVHS time-lapse videotape for the Healy Clean Coal Project. This TI specifically describes:

- Tracking and documenting SVHS videotape cassettes.
- Identifying and labeling SVHS videotape cassettes.
- Validating SVHS videotape quantity and quality.
- Duplicating, distributing, and archiving videotapes.

2.0 RESPONSIBILITIES

2.1 PROJECT MANAGER

The project manager shall oversee all collection, processing, and handling procedures.

2.2 DATA COORDINATOR

The data coordinator shall:

- Supply the site operator with videotape cassettes and all necessary monitoring supplies.
- Verify that scheduled site visits are performed and notify the site operator if he/she fails to make a scheduled visit.
- Review all videotape documentation completed by the site operator for completeness and accuracy, and file all documentation and correspondence in site-specific notebooks.
- Oversee videotape tracking.
- Review all videotape for quantity and quality.
- Resolve problems reported by the site operator and data technician.
- Complete the site-specific Operational History Log for each videotape cassette.
- Prepare all duplicate videotapes.

2.3 DATA TECHNICIAN

The data technician shall:

- Log receipt of all videotapes mailed to Air Resource Specialists, Inc. (ARS) from site operators on a site-specific Operational History Log.
- File all original and master videotapes and supporting documentation.
- Distribute duplicate videotapes as specified to project participants.

2.4 SITE OPERATOR

The site operator shall:

- Report any noted inconsistencies upon site servicing and videotape changing to the data coordinator.
- Service the monitoring site as scheduled to change the videotapes and complete a Time-Lapse Video Monitoring Status/Assessment Sheet and videotape label for each videotape cassette.
- Mail videotape cassettes and accompanying documentation to ARS.

3.0 REQUIRED EQUIPMENT AND MATERIALS

The following equipment and materials are used to collect, document, and validate SVHS videotapes:

- SVHS videotape cassettes
- Videotape labels
- Mailing envelopes
- Time-Lapse Video Monitoring Status/Assessment Sheets (both for the monitoring site and for the control room)
- Operational History Logs
- SVHS video cassette player
- Review monitor
- 3-ring notebooks

4.0 METHODS

This section includes three (3) major subsections:

- 4.1 Videotape Collection Procedures
- 4.2 Videotape Processing Procedures
- 4.3 Videotape Handling Procedures

4.1 VIDEOTAPE COLLECTION PROCEDURES

4.1.1 Videotape Purchase and Distribution

ARS purchases high quality videotapes in bulk quantities. ARS provides site operators with an operator's data acquisition kit that includes a 3-month supply of videotape cassettes, cassette mailers, tape labels, Time-Lapse Video Monitoring Status/Assessment Sheets, and a Time-Lapse Video Monitoring Field Procedures Notebook.

4.1.2 Field Documentation

Collection procedures for videotape include weekly site servicing visits by the site operator and bi-weekly visits to perform tape changes, and to mail videotapes and accompanying documentation to ARS. When servicing a site, the operator completes a videotape label and attaches it to the videotape cassette before loading the cassette into the VCR. An example videotape cassette label is provided as Figure 4-1. When the cassette is removed upon the next site servicing tape change, the operator completes the information on the cassette label, places the cassette in a padded envelope, and mails it, along with the Time-Lapse Video Monitoring Status/Assessment Sheet, to ARS via Federal Express.

	Tape # _____	Date _____	Time _____	Counter # _____
	Site _____	Begin _____	_____	_____
	Operator _____	End _____	_____	_____

Figure 4-1. Example Videotape Cassette Label.

Example Time-Lapse Video Monitoring Status/Assessment Sheets for the HCCP control room and the DNPP and Garner Hill monitoring sites are provided as Figures 4-2 and 4-3 respectively. Videotapes should be sent immediately to:

Air Resource Specialists, Inc.
1901 Sharp Point Drive Suite E
Fort Collins, CO 80525
Attention: Photographic Data Coordinator

**TIME-LAPSE VIDEO MONITORING
STATUS/ASSESSMENT SHEET
HCCP CONTROL ROOM**

Location: _____ Tape No. _____

Operator: _____

Date/Time of Site Visits #1: _____ : _____ #2: _____ : _____ #3: _____ : _____
Check procedures performed during each site visit in the appropriate column.

VIDEOTAPE LOADED	#1	#2	#3	Comments
Labeled videotape cassette	<input type="checkbox"/>			_____
Loaded videotape	<input type="checkbox"/>			_____

OPERATION/MAINTENANCE CHECK				
Verified camera alignment	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
Inspected video recording assembly	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
Record tape counter #	# _____	# _____	# _____	_____
Verified recorded image, date, and time	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____

Proceed to VIDEOTAPE REMOVAL section if changing tape

Repositioned tape	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
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CHECK OPERATION SETTINGS				
INT TIMER displayed	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
REC displayed	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
(appears only if activated during recording hours)				

VIDEOTAPE REMOVAL				
Removed videotape			<input type="checkbox"/>	_____
Completed videotape cassette label			<input type="checkbox"/>	_____
Mailed videotape and assessment sheet to ARS			<input type="checkbox"/>	_____

ADDITIONAL COMMENTS/ACTIONS TAKEN: _____

SUPPLIES NEEDED: _____

Enclose this Status/Assessment Sheet with the labeled videotape cassette and send to:



Figure 4-2. Example Time-Lapse Video Monitoring Status/Assessment Sheet for the HCCP Control Room Monitoring Site.

TIME-LAPSE VIDEO MONITORING STATUS/ASSESSMENT SHEET DNPP AND GARNER HILL MONITORING SITES		Location: _____ Tape No. _____		
Date/Time of Site Visits #1: _____ #2: _____ #3: _____		Operator: _____		
Check procedures performed during each site visit in the appropriate column.				
VIDEOTAPE LOADED	#1	#2	#3	Comments
Labeled videotape cassette	<input type="checkbox"/>			_____
Loaded videotape	<input type="checkbox"/>			_____
OPERATION/MAINTENANCE CHECK				
<u>DNPP:</u> Inspected camera assembly	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
Cleaned viewport	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
Checked air filter	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
Verified camera sled alignment	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
Verified adjustable head alignment	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
Inspected video recording assembly	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
Record tape counter #	# _____	# _____	# _____	_____
Verified recorded image, date, and time	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
<i>***Proceed to VIDEOTAPE REMOVAL section if changing tape***</i>				
Repositioned tape	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
<u>Garner Hill:</u> Inspected camera assembly	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
Cleaned viewport	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
Checked air filter	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
Verified pan/tilt head alignment	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
CHECK OPERATION SETTINGS				
INT TIMER displayed	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
REC displayed (appears only if activated during recording hours)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
SECURE SYSTEM				
<u>DNPP:</u> Secured camera assembly	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
Secured video recording assembly	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
Secured shelter	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
<u>Garner Hill:</u> Secured camera assembly	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
Secured shelter	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
VIDEOTAPE REMOVAL				
Removed videotape			<input type="checkbox"/>	_____
Completed videotape cassette label			<input type="checkbox"/>	_____
Mailed videotape and assessment sheet to ARS			<input type="checkbox"/>	_____
ADDITIONAL COMMENTS/ACTIONS TAKEN: _____				

SUPPLIES NEEDED: _____				

Enclose this Status/Assessment Sheet with the labeled videotape cassette and send to:				
 Air Resource Specialists, Inc. 1901 Sharp Point Drive, Suite E Fort Collins, CO 80525 Phone: 970-484-7941 Fax: 970-484-3423				

Figure 4-3. Example Time-Lapse Video Monitoring Status/Assessment Sheet for the DNPP and Garner Hill Monitoring Sites.

Further details on site servicing procedures and videotape collection procedures can be found in the following technical instructions:

- TI 4120-3650, *Routine Site Operator Maintenance Procedures for SVHS Time-Lapse Video Camera System at DNPP - Sony SSC-S20 Camera, Panasonic AG-6740 SVHS VCR, and Panasonic CT1384Y Monitor*
- TI 4120-3655, *Routine Site Operator Maintenance Procedures for SVHS Time-Lapse Video Camera System at Garner Hill – Sony SSC-S20 Camera, Pelco PT1250 Series Pan/Tilt, RWI 30CM Microwave Antenna, and Panasonic CT1384Y Monitor*
- TI 4120-3660, *Routine Site Operator Maintenance Procedures for SVHS Time-Lapse Video Camera System at HCCP – Panasonic AG-6740 SVHS VCR and Sony Monitor*

4.2 VIDEOTAPE PROCESSING PROCEDURES

4.2.1 Operational History Log

Completion of an Operational History Log is essential to ensure quality videotape documentation. Information recorded on the Operational History Log is partially derived from site operator documentation; the remainder of the information is recorded for tracking purposes during videotape handling. An example Operational History Log is provided as Figure 4-4. The following information is documented on the Operational History Log:

- Site
- Site operator
- Operating period
- Project
- TAPE # - Consecutive, chronological videotape number by site.
- DATE RECEIVED - Date when the videotape was received at ARS from the site.
- COMMENTS/CORRESPONDENCE - Notation of any comments or site operator correspondence pertaining to each specific videotape.
- MONITORING PERIOD DATES - The beginning and ending dates of the period documented on the videotape, as noted by the site operator on the status/assessment sheet and verified by review of the videotape.
- TIME ON/TIME OFF - The beginning and ending times of the period documented on the videotape, as noted by the site operator on the status/assessment sheet and verified by review of the videotape.

OPERATIONAL HISTORY LOG - TIME-LAPSE MONITORING

Site: _____											Operating Period/Interval: _____				
Site Operator: _____											Project: _____				
Tape #	Date Received	Comments/ Correspondence	Monitoring Period Dates	Time ON Time OFF	# Days Exp.	# Days Coll.	% of Pos.	Initial Review	Anomaly Review	Duplicate Copies					
										ADEC	AIDEA	GVEA	NPS	STEIGERS CORP.	

Figure 4-4. Example Operational History Log - Time-Lapse Monitoring.

- # DAYS EXP. - Number of days that should have been captured (expected) on the videotape, as noted by the site operator on the status/assessment sheet.
- # DAYS COLL. - The actual number of days captured (collected) on the videotape, recorded after review and validation of the videotape.
- % OF POSS. - The percentage of the number of days collected divided by the number of days expected, as a collection efficiency.
- INITIAL REVIEW - Initials of the videotape reviewer, documenting that the videotape has been initially reviewed for content and correct tape operation.
- ANOMALY REVIEW - Initials of the videotape reviewer, documenting that the videotape has been reviewed for any visual anomalies.
- DUPLICATE COPIES – Checked by the data coordinator indicating that duplicate videotape copies have been delivered to:
 - ADEC – Alaska Department of Environmental Conservation
 - AIDEA – Alaska Industrial Development and Export Authority
 - GVEA – Golden Valley Electric Association
 - NPS – National Park Service in Denali, Alaska
 - Steigers Corporation – project engineers

Operational History Logs and accompanying documentation are chronologically stored in 3-ring notebooks by site.

4.2.2 Time-Lapse Video Monitoring Status/Assessment Sheet Review

The Time-Lapse Video Monitoring Status/Assessment Sheet is thoroughly reviewed by the ARS data coordinator to verify proper video system operations and note any weather anomalies or requested operational supplies. Any noted operational discrepancies are documented by site and videotape number on the Operational History Log and corrective action is initiated. Any requested monitoring supplies or photographic components are shipped within 24 hours, provided sufficient backup equipment/supplies are available.

4.3 VIDEOTAPE HANDLING PROCEDURES

4.3.1 Videotape Labeling and Filing

After each videotape is received at ARS, the label affixed to it by the site operator is verified for correct information. This information is also documented on the Operational History Log. The labeled videotapes are placed chronologically in site-specific storage boxes within storage cabinets. All supporting documentation including the Operational History Logs, Time-Lapse Video Monitoring Status/Assessment Sheets, and other notes or important observations are kept in 3-ring notebooks by site, and filed in the storage cabinets alongside the videotapes.

4.3.2 Qualitative Videotape Review

The qualitative review of videotapes occurs in three stages:

- Stage-1 Continuity Review and Problem Resolution
- Stage-2 Weather Condition, Anomaly, and Event Identification
- Stage-3 Evaluation of Observed Anomalies and Events

During Stage-1, videotapes are reviewed for camera and system component operation, exposure quality, frame alignment and focus, timing (including on/off times and exposure interval), the detection of unusual visual events or anomalies, and dirty or obscured shelter windows (due to snowfall, dirt, foreign objects, etc.). Videotapes are reviewed within 2 days of receipt at ARS. Any noted problems or inconsistencies observed on the videotapes are recorded on the Operational History Log and the data coordinator immediately initiates corrective actions. The data coordinator discusses corrective action with the site operator and if appropriate, sends replacement equipment to the site. Refer to TI 4120-3750, TI 4120-3755, and TI 4120-3760, for troubleshooting procedures for DNPP, Garner Hill, and HCCP, respectively.

The videotapes next undergo Stage-2 and Stage-3 qualitative analyses that document observed meteorological conditions and identify and thoroughly describe visual events of interest. Stage-2 and Stage-3 qualitative review procedures are detailed in TI 4420-5050, *Qualitative Time-Lapse Videotape Review for the Healy Clean Coal Project*.

4.3.3 SVHS Videotape Duplication, Distribution, and Archives

Original videotapes are delivered to ARS every two weeks by the site operator via an express delivery service. Each tape is shipped separately with tracking numbers. ARS immediately creates two duplicates of every SVHS tape. One duplicate is retained by ARS and stored off-site. The other is returned to GVEA for storage in the Healy Viewing Center.

The original SVHS videotapes are then copied to monthly master SVHS tapes and VHS copies for delivery to the following agencies with quarterly data reports:

- ADEC – Alaska Department of Environmental Conservation
- AIDEA – Alaska Industrial Development and Export Authority
- GVEA – Golden Valley Electric Association
- NPS – National Park Service in Denali, Alaska
- Steigers Corporation – project engineers