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1.0 PURPOSE AND APPLICABILITY

This standard operating procedure (SOP) describes site configuration requirements for photographic monitoring systems. These requirements may differ from system to system depending upon specific project goals and siting specifications. The purpose of this SOP is to assure constant, quality data and minimize data loss by:

- Ensuring that the monitoring systems are configured at locations that view important features, that meet monitoring or surveillance objectives, and are secure from potential vandalism.
- Training site operators on photographic or video monitoring system configuration requirements and operation.

Documenting visibility or visual events and trends is an important aspect of evaluating existing or potential impairment in Class I and other visibility-sensitive areas. Photography is an efficient way to document these events and trends and is an effective method of communicating visual relationships to decision-makers and to the public. Self-contained, automatic camera monitoring systems or time-lapse video monitoring systems are easily installed and operated. Camera-based monitoring, referred to as scene monitoring, is an effective, economical component of any visibility monitoring program.

An automatic camera visibility monitoring station takes 35 mm slides or high-resolution digital images of a selected vista at user-selected times throughout the day. The station can also be outfitted with an 8 mm time-lapse camera or an SVHS time-lapse recorder to document the dynamics of visibility events. Day-to-day variations in visual air quality captured on 35 mm color photographic slides, digital images, 8 mm color movie film, or SVHS videotape can be used to:

- Document how vistas appear under various visual air quality, meteorological, and seasonal conditions. Scene characteristics include observer visual range, scene contrast, color, texture, and clarity.
- Record the frequency that various visual air quality conditions occur (e.g., incidence of uniform haze, layered haze, or weather events).
- Provide a quality assurance reference for collocated measurements.
- Determine the visual sensitivity of individual areas or views to variations in ambient air quality.
- Identify areas of potential impairment.
- Estimate the optical properties of the atmosphere under certain conditions.
- Provide quality media for visually presenting program goals, objectives, and results to decision-makers and to the public.
- Provide support data for the computer image modeling of potential impairment.
- Support color and human perception research.

Slides, digital images, movie film, and videotape, however, do not provide quantitative information about the cause of visibility impairment. Aerosol and optical properties of the atmosphere must be independently monitored where cause and effect relationships are required.

In addition to visibility monitoring, time-lapse video systems can be used for a variety of other purposes, including:

- Environmental monitoring such as wildlife, waterflow, and source monitoring.
- Security monitoring for remote industrial sites and storage depots.
- Construction monitoring for building sites or highway and bridge construction.
- Event monitoring for remote weather documentation or highway and airport conditions.
- Recreation monitoring for ski areas and river rafting.

Specific information regarding site selection criteria is provided in SOP 4055, *Site Selection for Scene Monitoring Equipment*. The following technical instruction (TI) provides detailed information regarding specific site configuration procedures:

- TI 4080-3100 *Site Configuration for SVHS Time-Lapse Video Monitoring Equipment for the Healy Clean Coal Project*

2.0 RESPONSIBILITIES

2.1 PROJECT MANAGER

The project manager shall:

- Provide the field specialist with site configuration materials including photographic documentation, maps, and approved installation location, vista, and configuration specifications.
- As required, review the determined site configuration requirements with the project engineers.
- Schedule an operator training session with pertinent routine servicing personnel and the field specialist.

2.2 FIELD SPECIALIST

The field specialist shall:

- Review the determined site configuration requirements with the local contact and project manager.
- Ensure that the equipment is installed and configured according to project guidelines.
- Schedule an operator training session with pertinent routine servicing personnel and the project manager.

2.3 LOCAL (ON-SITE) CONTACT

The local contact shall:

- Review the determined site configuration requirements with the field specialist.
- Schedule an operator training session with the field specialist and the project manager.

3.0 REQUIRED EQUIPMENT AND MATERIALS

3.1 SITE CONFIGURATION EQUIPMENT FOR 35 MM AUTOMATIC CAMERA SYSTEMS

A 35 mm automatic camera monitoring system consists of a camera and other components in an enclosure. A 35 mm camera may be configured with an 8 mm camera within the same enclosure. Components for a 35 mm camera configuration include:

- A 35 mm automatic camera
- A camera lens, generally 50 mm to 135 mm
- A programmable timer to trigger the camera
- A databack to imprint date and time on the film
- Batteries to operate all components
- A camera mount
- An environmental enclosure (with heater if required)
- A mounting post

3.2 SITE CONFIGURATION EQUIPMENT FOR 8 MM TIME-LAPSE CAMERA SYSTEMS

An 8 mm time-lapse camera monitoring system consists of a camera and other components in an enclosure. . An 8 mm camera may be configured with a 35 mm camera within the same enclosure. Components for an 8 mm camera configuration include:

- An 8 mm time-lapse movie camera with internal intervalometer
- A camera lens, generally 50 mm to 135 mm
- A programmable timer to trigger the camera on and off
- Batteries to operate all components
- A camera mount

- An environmental enclosure (with heater if required)
- A mounting post

3.3 SITE CONFIGURATION EQUIPMENT FOR DIGITAL CAMERA SYSTEMS

A high-resolution digital camera system consists of a camera, image capture computer, and image capture software in an enclosure. Specific components include:

- A digital camera that provides:
 - High-resolution JPEG images – 1280 x 960, 24-bit true color
 - Optical zoom of 38 to 114 mm (35 mm SLR equivalent)
 - RS-232 serial interface (high-resolution images can be taken at up to 3-minute intervals)
- An image capture computer with:
 - A Pentium processor
 - Windows 95/98/NT
 - A 1.2 gigabyte hard disk
 - (2) Type 2 PCMCIA slots
 - A PC-card 56K telephone modem or PC-card cellular telephone/modem
- Image capture software for:
 - Windows 95/98/NT
 - A 32-bit Windows program
 - Image acquisition via telephone, cellular telephone, or on-site image collection
 - User selectable JPEG image resolutions
- An environmental enclosure (with heater if required)
- A camera mount
- Electrical power (AC power or DC solar power)

3.4 SITE CONFIGURATION EQUIPMENT FOR SVHS TIME-LAPSE VIDEO SYSTEMS

An SVHS time-lapse video monitoring system consists of a camera assembly and a video recording assembly. Components included in each assembly are:

- Camera assembly:
 - A color video camera
 - A zoom camera lens, generally 8 mm to 48 mm
 - A pan/tilt camera mount
 - A mounting post with mounting plate
 - A camera enclosure
 - An uninterruptible power supply

- Video recording assembly:
 - A shelter (6' x 6' with heater)
 - An SVHS VCR for time-lapse recording
 - A color review monitor
 - An uninterruptible power supply

Other components may be required such as microwave transmission/receiver assemblies, or various remote control assemblies, depending upon siting requirements and situations, and project objectives.

4.0 METHODS

Scene monitoring station configurations are based on:

- Monitoring location and monitored scenic vista or view of interest.
- Frequency that various visual air quality conditions or monitoring interests occur.
- Complexity of diurnal variations and observed visibility events.
- Collocated air quality monitoring instrumentation.
- Site-specific monitoring objectives.
- Proximity to AC power if an AC SVHS time-lapse system is used.

For further information on site selection requirements, see SOP 4055, *Site Selection for Scene Monitoring Equipment*.

An automatic 35 mm camera system documents observed visual air quality at user selected times throughout the day. Photographic slides often provide a quality assurance reference for collocated visibility measurements. Slides are also a quality media that can be easily replicated or digitized to support computer image modeling and perception research. A high-resolution digital camera system can internally store up to 1,400 high-resolution images on its hard disk, which can be downloaded on demand by telephone or be directed to an independent on-site computer or other mass storage media. Automatic 8 mm time-lapse camera systems or SVHS time-lapse recorders document the dynamics of ongoing air quality and meteorological related events or other events.

This section describes site configuration procedures in four (4) major subsections:

- 4.1 Configuration of 35 mm and 8 mm Automatic Camera Monitoring Equipment
- 4.2 Configuration of Digital Camera Monitoring Equipment
- 4.3 Configuration of SVHS Time-Lapse Video Monitoring Equipment
- 4.4 Operator Training

4.1 CONFIGURATION OF 35 MM AND 8 MM AUTOMATIC CAMERA MONITORING EQUIPMENT

The 35 mm and 8 mm automatic camera monitoring sites have few options in equipment configuration. Standard configuration for these systems includes a camera assembly located inside an environmental enclosure. The enclosure rests on a mounting post viewing the scene of interest. These monitoring systems are battery-powered and require periodic servicing. Configuration options include camera type (35 mm and/or 8 mm), lens size, exposure frequency, an enclosure heater option, and a single-port (one camera system) or double-port (two camera systems) enclosure.

4.2 CONFIGURATION OF DIGITAL CAMERA MONITORING EQUIPMENT

The digital camera system includes a high-resolution digital camera with computer located inside an environmental enclosure. The enclosure rests on a mounting post viewing the scene of interest. These monitoring systems require AC or DC solar power and may be serviced through remote telephone connections. Configuration options include a regular telephone or cellular telephone connection, or an independent on-site computer or other mass storage media to store the acquired images. Image resolution and frequency of image capture are other options.

4.3 CONFIGURATION OF SVHS TIME-LAPSE VIDEO MONITORING EQUIPMENT

SVHS video monitoring sites may be installed using a wide variety of equipment configurations. Configurations are determined by specific project goals and objectives, monitoring interests, availability of power, and environmental conditions.

Generally, video monitoring sites are configured in two parts, a camera assembly and a video recording assembly. The camera assembly consists of an SVHS color video camera located inside a heated enclosure. The enclosure rests on a mounting post viewing the scene of interest. The video recording assembly is situated in a nearby shelter and includes a color monitor and a VCR to record the monitoring. Additional equipment may include a modem to transfer recorded camera images, additional monitors and VCRs (for real-time event programming), or a remote control unit for the camera function. The VCRs may be programmed as required for the specific needs of the monitoring project.

4.4 OPERATOR TRAINING

Operator training is provided by the field specialist following the completion of the photographic or video system configuration and equipment installation. Supplemental and refresher training is provided during scheduled site visits by the field specialist, and ARS telephone support is always available. Site operators are trained on photographic or video system requirements and routine maintenance procedures, including:

- An overview of project and system components
- Power supply, distribution, and cabling
- Signal connectors and cabling

- Heater systems
- Component replacement
- Camera and component function and operation
- On-site video monitor operation
- Recorded videotape review
- Film or videotape replacement
- Log sheet completion
- Troubleshooting
- ARS contact personnel

A site operator's manual is also provided to site operators. This manual contains technical instructions applicable to the specific camera or video monitoring equipment located at the site. Additional manufacturer's instruction booklets and pertinent maintenance documentation forms are also included in the manual.

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1.0 PURPOSE AND APPLICABILITY

This technical instruction (TI) describes site configuration requirements for SVHS time-lapse video monitoring camera systems for the Healy Clean Coal Project (HCCP). The purpose of this TI is to assure consistent, quality data and minimize data loss by:

- Ensuring that the monitoring systems are configured at locations that view important features, that meet surveillance objectives, and are secure from potential vandalism.
- Training site operators on video monitoring system configuration requirements and operation.

Three video monitoring sites have been installed for the Healy Clean Coal Project (see Figure 1-1):

- Denali National Park and Preserve (DNPP) (video camera and VCR)
- Garner Hill (video camera and microwave transmitter)
- Healy Clean Coal Project (HCCP) (time-lapse VCR, real-time VCR, and microwave receiver)

Images captured at Garner Hill are transmitted by microwave and received at HCCP.

2.0 RESPONSIBILITIES

2.1 PROJECT MANAGER

The project manager shall:

- Provide the field specialist site configuration materials including photographic documentation, maps, and approved installation location, vista, and configuration specifications.
- As required, review the determined site configuration requirements with the project engineers.
- Schedule an operator training session with pertinent routine servicing personnel and the field specialist.

2.2 FIELD SPECIALIST

The field specialist shall:

- Review the determined site configuration requirements with the local contact and project manager.
- Schedule an operator training session with pertinent routine servicing personnel and the project manager.

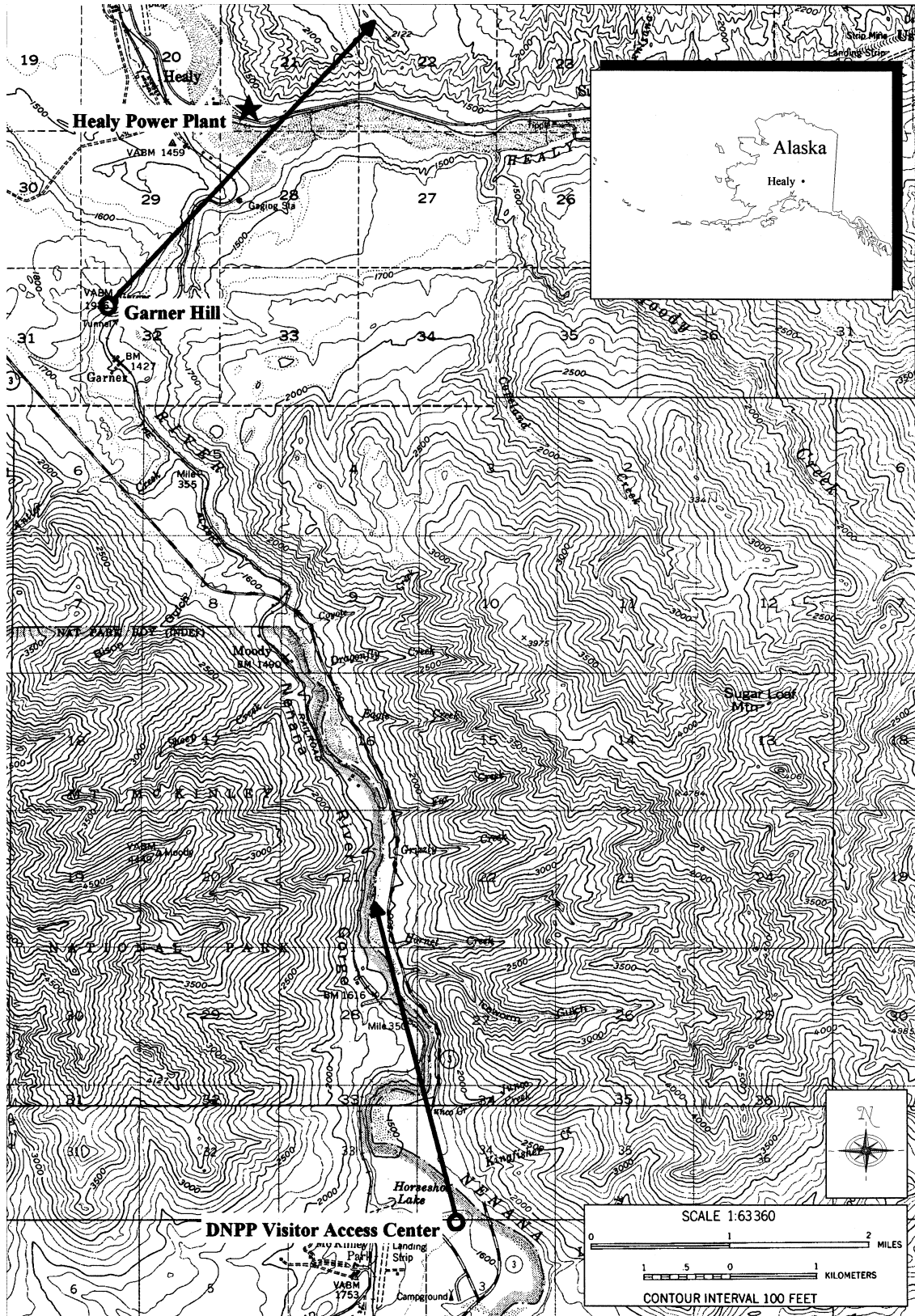


Figure 1-1. Map Showing the Monitoring Sites for the HCCP Monitoring Program.

2.3 LOCAL (ON-SITE) CONTACT

The local contact shall:

- Review the determined site configuration requirements with the field specialist.
- Schedule an operator training session with the field specialist and the project manager.

3.0 REQUIRED EQUIPMENT AND MATERIALS

3.1 SITE CONFIGURATION EQUIPMENT FOR DNPP

The time-lapse video monitoring system at DNPP consists of a camera assembly and a video recording assembly. The components included in each assembly are:

Camera assembly components:

- Pelco NEMA 3R series camera enclosure with heated window and sun shroud
- Sony SSC-S20 CCD color video camera
- Cosmicar/Pentax zoom lens (8mm–48mm)
- Manual pan/tilt camera mount
- Mounting post with mounting plate
- Concrete pad
- Power distribution box with interconnect cabling

Video recording assembly components:

- Shelter (custom wood-frame 6'x6' building with 1500 watt baseboard heater)
- Panasonic AG-6740 SVHS VCR for time-lapse recording
- Panasonic CT1384Y color monitor
- Motorola cellular telephone
- Exterior telephone antenna
- Uninterruptible power supply (UPS)

3.2 SITE CONFIGURATION EQUIPMENT FOR GARNER HILL

The time-lapse video monitoring system at Garner Hill consists of a camera assembly and a microwave transmission assembly. The components included in each assembly are:

Camera assembly components:

- Pelco NEMA 3R series camera enclosure with heated window and sun shroud
- Sony SSC-S20 CCD color video camera
- Cosmicar/Pentax zoom lens (8mm-48mm)
- Pan/tilt camera mount and remote control pan/tilt unit
- Rohn 45 tower with lightning protection

Microwave transmission assembly components:

- Ekto Manufacturing 6'x6' metal shelter secured with ground anchors
- Panasonic CT1384Y color monitor
- Radio Waves, Inc. 23 62 microwave transmitter/receiver electronics and antenna
- Uninterruptible power supply (UPS)

Images captured at Garner Hill are transmitted by microwave to HCCP.

3.3 SITE CONFIGURATION EQUIPMENT FOR HCCP

The time-lapse video monitoring system at HCCP consists of a video recording assembly and a microwave receiver assembly. The components included in each assembly are:

Video recording assembly components:

- Sony Trinitron PUM-14N2A color review monitor
- Panasonic AG-6740 SVHS VCR for time-lapse recording
- Panasonic AG-6740 SVHS VCR for real-time recording of declared events
- Panasonic AG-1980P SVHS VCR review unit
- Uninterruptible power supply (UPS)
- Sigma Electronics VOA-21 video distribution amplifier

Microwave receiver assembly components:

- Radio Waves, Inc. 23 62 microwave transmitter/receiver electronics and antenna
- Pelco 9500 Series joystick transmitter/controller
- Multitech 4-wire modem

4.0 METHODS

This section describes site configuration procedures in four (4) major subsections:

- 4.1 Configuration of Video Monitoring Equipment at DNPP
- 4.2 Configuration of Video Monitoring Equipment at Garner Hill
- 4.3 Configuration of Video Monitoring Equipment at HCCP
- 4.4 Operator Training

4.1 CONFIGURATION OF VIDEO MONITORING EQUIPMENT AT DNPP

The DNPP site is configured in two parts, a camera assembly and a video recording assembly. A functional diagram of the DNPP configuration is provided as Figure 4-1. The standard view captured by the camera is presented as Figure 4-2.

The Sony SSC-S20 camera requires 24 VAC power. It is provided via a 120 VAC uninterruptible power supply (UPS) in the recording assembly shelter routed through conduit to a power strip located on the camera assembly post. A 24 VAC fused transformer is plugged into the power strip and is routed directly to the camera via a clamped access hole in the Pelco enclosure.

The Pelco enclosure heater and ventilation fan require 120 VAC. It is provided via a surge protected power strip in the recording assembly shelter routed through conduit to a power strip located on the camera assembly post. A 120 VAC line is plugged into this power strip and routed directly to the Pelco heater via the clamped access hole. Note that this power line does not connect to the UPS.

The S-video signal cable is routed directly from the "S-video out" on the back of the Sony SSC-S20 camera to the "S-video in" connector on the back of the time-lapse VCR via the clamped access hole in the Pelco enclosure and metal conduit to the recording assembly shelter.

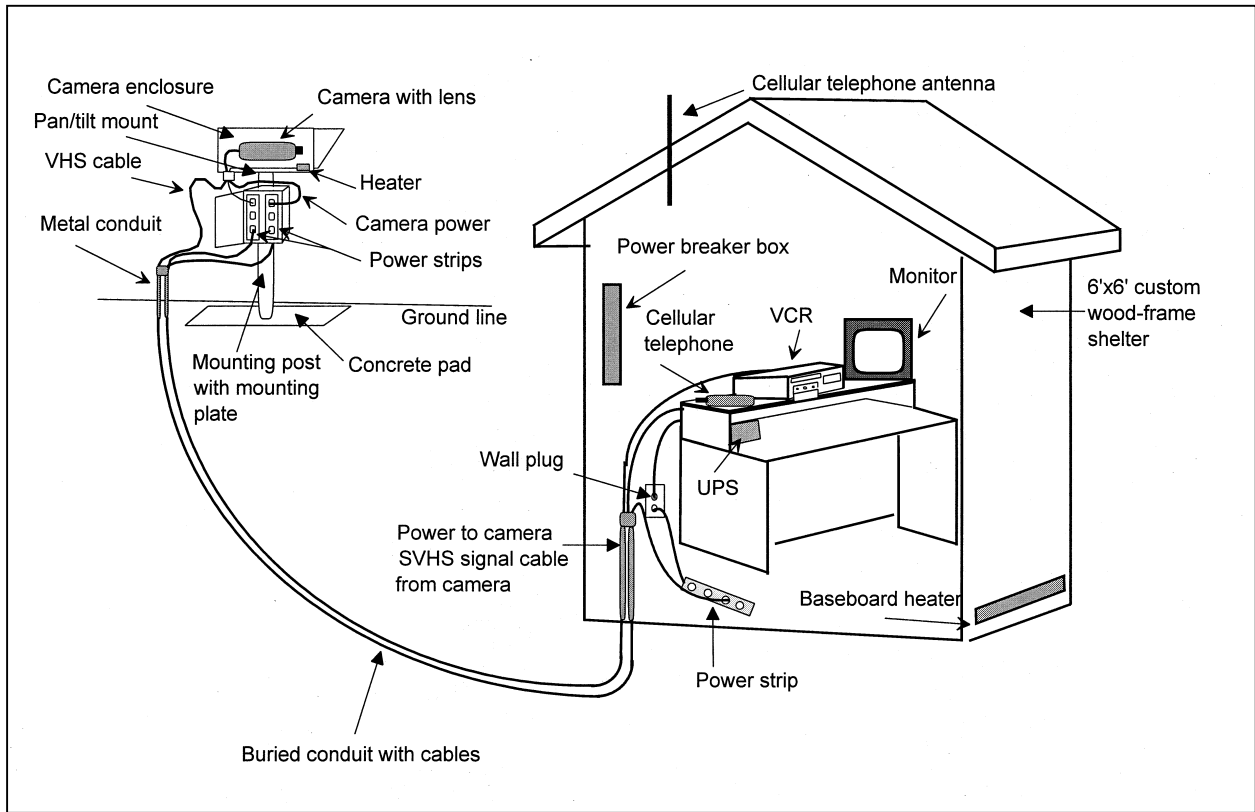


Figure 4-1. Configuration Diagram of Video Monitoring Components at DNPP.



Figure 4-2. View Taken With Video Camera at DNPP.

4.1.1 Camera Assembly at DNPP

The camera assembly consists of an SVHS color video camera located inside a heated enclosure (see Figure 4-3). The enclosure sits atop a mounting post on a concrete pad viewing northward, toward Moody Gap (see Figure 1-1). The camera has one standard setting; the "MODE" selection switch is set to **AUTO**.

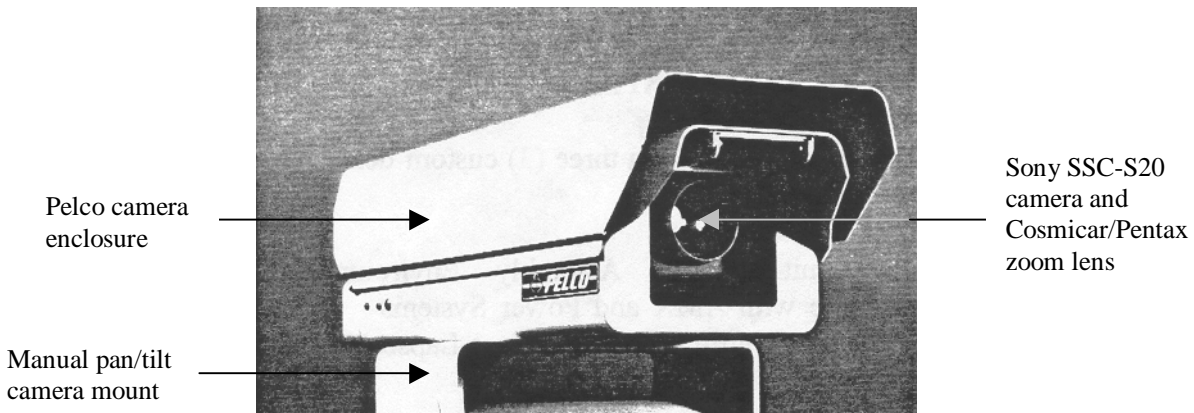


Figure 4-3. Photograph of the Camera Assembly at DNPP.

4.1.2 Video Recording Assembly at DNPP

The video recording assembly is 55 feet away from the camera assembly in a wooden, heated shelter (see Figure 4-4). Monitoring components in the shelter include a VCR, video monitor, UPS, and cellular telephone (see Figure 4-5).

The video monitor has one standard setting; the VIDEO SELECT switch is set to "VIDEO INPUT 1". The VCR standard settings are listed in Table 4-1.

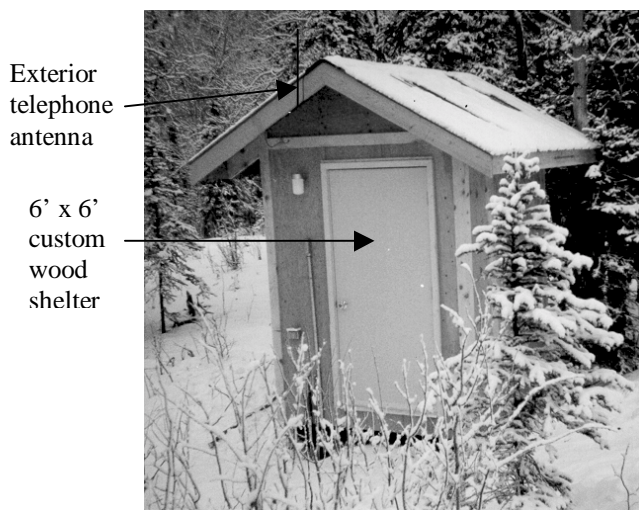


Figure 4-4. Video Recording Assembly Shelter at DNPP.

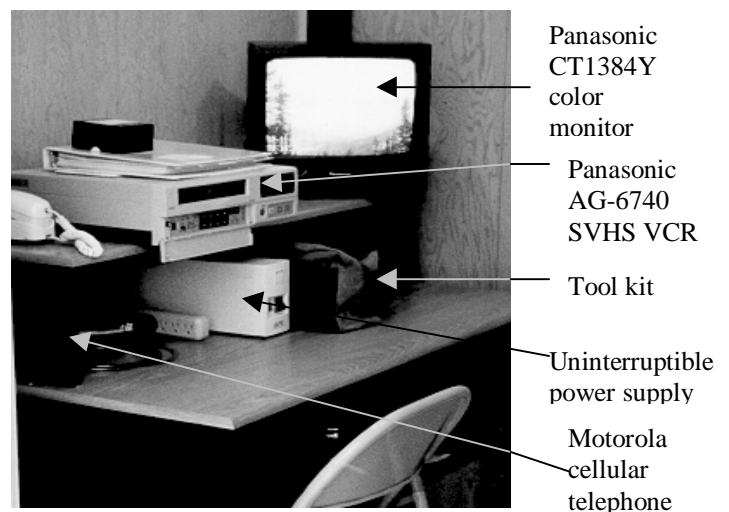


Figure 4-5. VCR and Video Monitor Installed in DNPP Shelter.

Table 4-1
Time-Lapse Monitoring System VCR Settings
for the DNPP Monitoring Site

Menu Screen	Switch/Option	Correct Setting
1	(Display) Mode Character Position Time Select Data Time Select T-Mode (Rec Indicated) Not Rec	T/D WHITE L-BOTTOM 24HOUR ON ON ON CAMERA
2	(VTR Mode Select 1) (High Density Rec) Mode (Rec T-Mode) (Tape in) (Tape end) Alarm in (Eject Operation) Mode	ON OFF STOP STOP STOP EJECT
3	(VTR Mode Select 2) Power Loss Memory ** ** * * * * * (Video) Mode In S-VHS REC (Time Adjusting) Set Time Operation	AUTO S-VIDEO ON 5:00 MASTER
4	(Alarm/Sensor Rec) Mode Duration Buzzer Repeat in (Reset Pulse) Input Level (Camera SW) Timing Mode	OFF 0.5MIN OFF OFF HIGH 1FIELD TM2
5	(1-Shot REC) Field Interval (Tape Remain) Buzzer (Rec Review) Auto Err Buzzer (Err Warn Buzzer)	1 3MIN OFF OFF OFF OFF OFF
6	(Internal Timer Rec) Sun Mon Tue Wed Thu Fri Sat DLY	Start End T-M OFF OFF OFF OFF OFF OFF OFF (See Table 4-2) 480H
Other	Program Switch Rec Lock Time Mode Time/Counter Rec Mode	OFF OFF 2H or 6H COUNT INT

The only parameter that will vary from the table is the Internal Timer Record settings for automatic recording times. These values are set seasonally to accommodate day-length. The Internal Timer Record start and stop times and T-M are set by the site operator according to the times specified for the monitoring program. (see Table 4-2).

Refer to TI 4120-3650, *Routine Site Operator Maintenance Procedures for the SVHS Time-Lapse Video Camera System at DNPP - Sony SSC-S20 Camera, Panasonic AG-6740 SVHS VCR, and Panasonic CT1384Y Monitor*, for complete system operational procedures.

Table 4-2

VCR Monthly Recording Start/Stop Timer Settings
Healy Clean Coal Project, Post-Construction Visibility Monitoring Program

Healy, Yukon-Koyukuk County, Alaska (longitude W149.0° latitude N63.9°)												
Adjustment Date	1-Jan	1-Feb	1-Mar	1-Apr	1-May	1-Jun	1-Jul	1-Aug	1-Sep	1-Oct	1-Nov	1-Dec
Video Start*	08:30	07:00	05:30	03:30	00:00	00:00	00:00	02:30	04:30	06:00	07:30	09:30
Video Stop*	18:00	19:00	20:30	22:30	00:00	00:00	00:00	00:00	21:00	19:00	17:30	16:00

* All times are in Standard Time. Do not set the VCR time to Daylight Saving Time.

Sunrise/Sunset Reference Table

Date	31-Jan	28-Feb	31-Mar	30-Apr	31-May	22-Jun	1-Jul	1-Aug	1-Sep	1-Oct	1-Nov	22-Dec
Standard/daylight	AST	AST	AST	ADT	ADT	ADT	ADT	ADT	ADT	ADT	AST	AST
Begin civil twilight	08:40	07:18	05:29	04:27				03:39	05:47	07:18	07:45	09:29
Sunrise	09:37	08:06	06:18	05:33	03:58	03:31	03:40	05:06	06:39	08:05	08:38	10:46
Sun transit	13:09	13:08	13:00	13:53	13:54	13:58	14:00	14:02	13:56	13:45	12:39	12:55
Sunset	16:43	18:12	19:44	22:15	23:51	00:25	00:18	22:56	21:10	19:25	16:40	15:03
End civil twilight	17:40	19:00	20:34	23:23				00:20	22:02	20:12	17:33	16:20

Source:

U.S. Naval Observatory, Astronomical Applications Department
http://aa.usno.navy.mil/AA/data/docs/RS_OneDay.html

4.2 CONFIGURATION OF VIDEO MONITORING EQUIPMENT AT GARNER HILL

The Garner Hill site (see Figure 1-1) is configured in two parts, a camera assembly and a microwave transmission assembly. The microwave receiver assembly and video recording assembly associated with this camera are located at HCCP. Figure 4-6 is a photograph of the Garner Hill configuration. The standard view captured by the camera is presented as Figure 4-7. This view can be changed by the HCCP operator to document a visibility event.

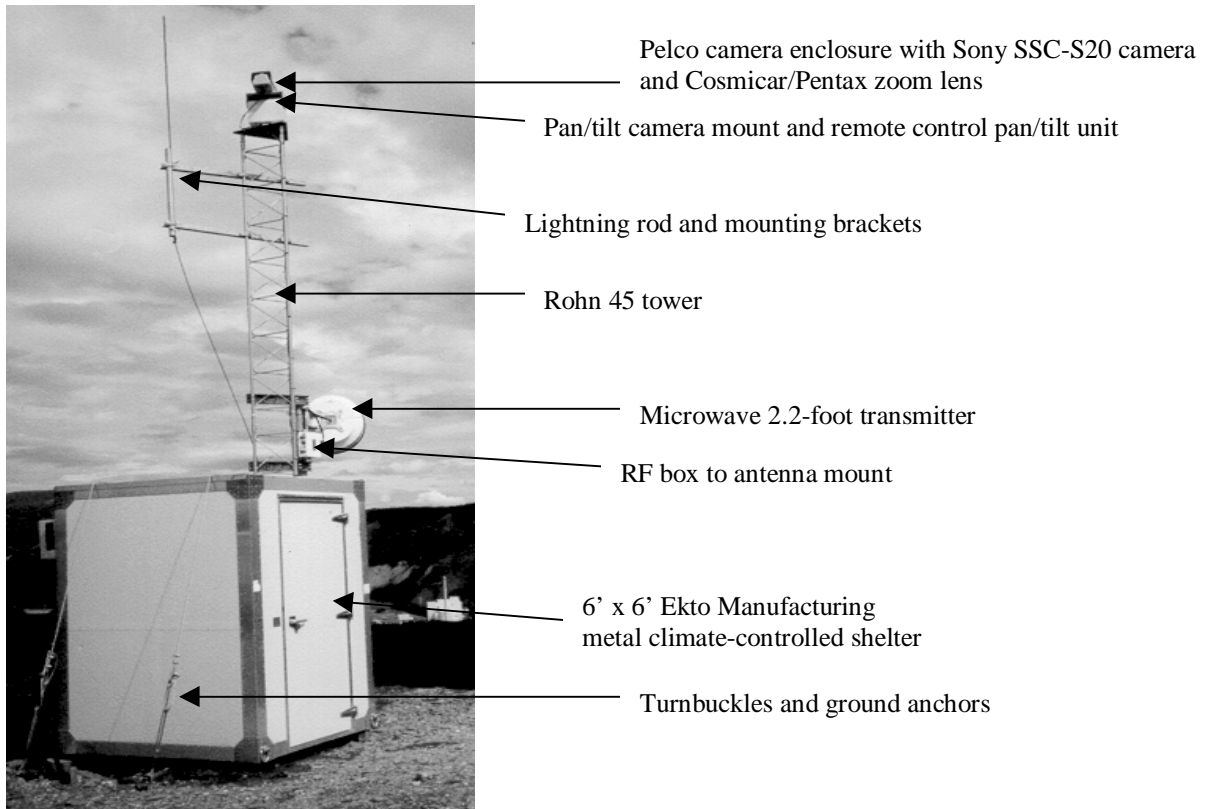


Figure 4-6. Configuration Photograph of Monitoring Components at Garner Hill.



Figure 4-7. View Taken With Video Camera at Garner Hill.

4.2.1 Camera Assembly at Garner Hill

The camera assembly consists of a color video camera located inside a heated enclosure with a remote control pan/tilt unit (see Figure 4-8). The enclosure sits atop a tower viewing HCCP. The camera has one standard setting; the “MODE” selection switch is set to **AUTO**.

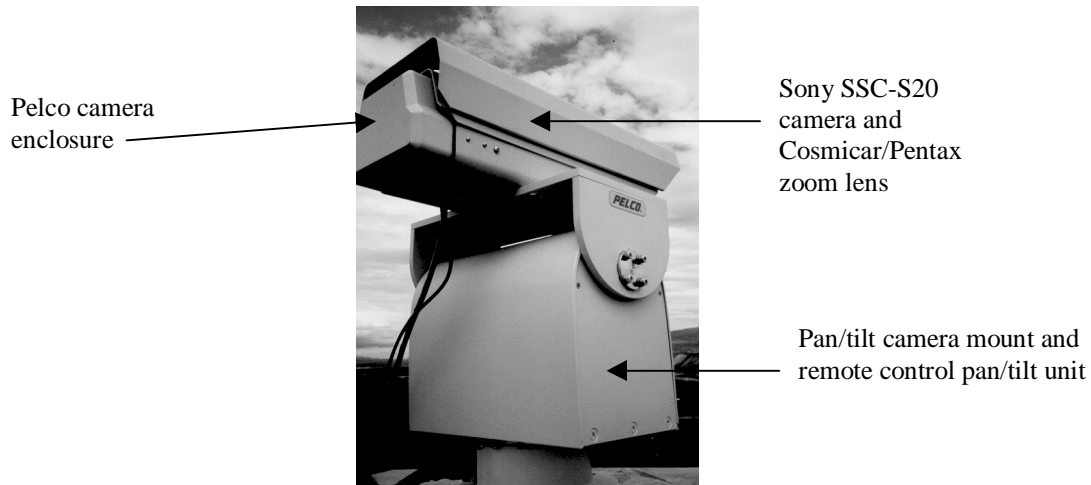


Figure 4-8. Photograph of the Camera Assembly at Garner Hill.

The video monitor has one standard setting; the “VIDEO SELECT” switch is set to **VIDEO INPUT 1**.

4.2.2 Microwave Transmission Assembly at Garner Hill

The microwave transmission assembly is situated on the same tower as the camera (see Figure 4-6). The tower is attached to a heated shelter, which houses a video monitor used to verify proper camera alignment, and the microwave transmitter electronics. The video monitor has one standard setting; the “VIDEO SELECT” switch is set to **VIDEO INPUT 1**. The video monitor is used by the operator to ensure camera operation and to assist in focusing and system troubleshooting.

A technician from HSE Communications installed and configured the microwave components (FCC license #739592). The real-time analog signal from the camera is translated by the microwave receiver/transmitter and forwarded to the microwave antenna. The 2½-foot antenna is securely mounted 12 feet above ground level to ensure a direct, unobstructed line of site from Garner Hill to the plant. The microwave operates at 23GHz and does not interfere with other communications bands that exist on Garner Hill or at the plant. The microwave receiver/transmitter also can receive positioning signals from the HCCP joystick controller and direct the signals to the automatic pan/tilt head.

Refer to TI 4120-3655, *Routine Site Operator Maintenance Procedures for the 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*, for complete system verification procedures.

4.3 CONFIGURATION OF VIDEO MONITORING EQUIPMENT AT HCCP

The HCCP site (see Figure 1-1) is configured in two parts, a video recording assembly and a microwave receiver assembly. The microwave transmitter assembly and camera associated with this equipment are located at Garner Hill.

4.3.1 Video Recording Assembly at HCCP

The video recording assembly is situated in the control room at HCCP. Monitoring components are located in an instrument rack (see Figure 4-9) and include (from top to bottom on the right side of the rack): two color monitors, a joystick transmitter/controller to operate the camera at Garner Hill, an event VCR to record real-time events, a time-lapse VCR to record standard monitoring programming, a modem, and a microwave converter. Computer components are used by RTP, Inc. to collect data from Bison Gulch and are not part of the video assembly.

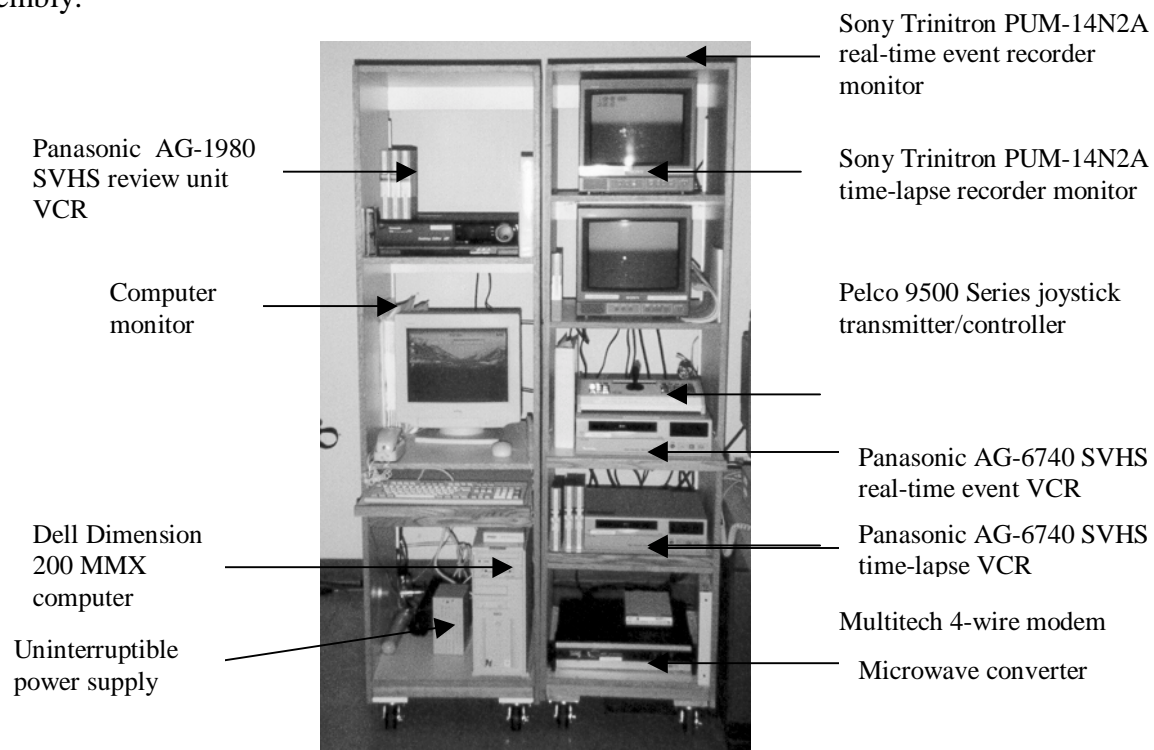


Figure 4-9. Photograph of the Video Recording Assembly at HCCP.

The video monitors have one standard setting; the “LINE A” button is the selected input. All other switches are set to the factory default settings. Both time-lapse VCRs have standard settings as listed in Table 4-3. Check each menu screen against the values in the table. The only parameter that can vary from the table is the Internal Timer Record settings for automatic recording times. These values are set seasonally to accommodate day-length. The Internal Timer Record start and stop times and T-M are set by the site operator according to the times specified in Table 4-2.

Refer to TI 4120-3660, *Routine Site Operator Maintenance Procedures for the SVHS Time-Lapse Video Camera System at HCCP – Panasonic AG-6740 SVHS VCR and Sony Monitor*, for complete system verification procedures.

Table 4-3
Time-Lapse Monitoring System VCR Settings
for the HCCP Monitoring Site

Menu Screen	Switch/Option	Correct Setting		
1	(Display)			
	Mode	T/D		
	Character	WHITE		
	Position	L-BOTTOM		
	Time Select	24HOUR		
	Data	ON		
	Time Select	ON		
	T-Mode	ON		
(Rec Indicated)	Not Rec	CAMERA		
2	(VTR Mode Select 1) (High Density Rec)			
	Mode	ON		
	(Rec T-Mode)	OFF		
	(Tape in)	STOP		
	(Tape end)	STOP		
	Alarm in	STOP		
	(Eject Operation) Mode	EJECT		
3	(VTR Mode Select 2) Power Loss Memory ** ** * * * * * **			
	(Video)			
	Mode	AUTO		
	In	LINE		
	S-VHS REC	ON		
	(Time Adjusting)			
	Set Time	5:00		
	Operation	MASTER		
4	(Alarm/Sensor Rec)			
	Mode	OFF		
	Duration	0.5MIN		
	Buzzer	OFF		
	Repeat in	OFF		
	(Reset Pulse)			
	Input Level	HIGH		
	(Camera SW) Timing Mode	1FIELD TM2		
5	(1-Shot REC)			
	Field	1		
	Interval	3MIN		
	(Tape Remain)			
	Buzzer	OFF		
	(Rec Review)			
	Auto	OFF		
Err Buzzer	OFF			
(Err Warn Buzzer)	OFF			
6	(Internal Timer Rec)	Start	End	T-M
	Sun	OFF		
	Mon	OFF		
	Tue	OFF		
	Wed	OFF		
	Thu	OFF		
	Fri	OFF		
	Sat	OFF		
	DLY	(See Table 4-2)		480H
Other	Program Switch	OFF		
	Rec Lock	OFF		
	Time Mode	2H OR 6H		
	Time/Counter	COUNT		

4.3.2 Microwave Receiver Assembly at HCCP

The microwave receiver assembly is situated on the north side of the control room at HCCP (see Figure 4-10).

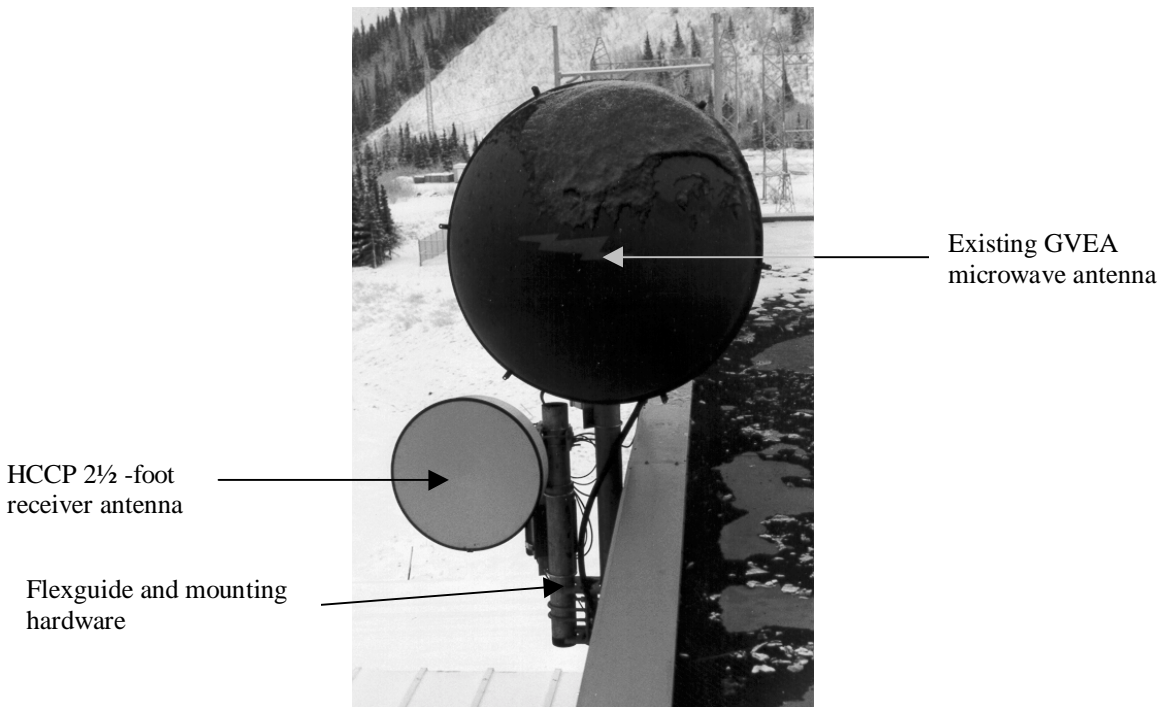


Figure 4-10. Configuration Photograph of Microwave Receiver Assembly at HCCP.

A technician from HSE Communications installed and configured the microwave components (FCC license #739591). The real-time analog signal from the camera is translated by the microwave receiver/transmitter and forwarded to the microwave antenna. The 2½-foot antenna is securely mounted 35 feet above ground level to ensure a direct, unobstructed line of site from Garner Hill to the plant. The microwave operates at 23GHz and does not interfere with other communications bands that exist on Garner Hill or at the plant. The microwave receiver/transmitter also can receive positioning signals from the HCCP joystick controller and direct the signals to the automatic pan/tilt head.

4.4 OPERATOR TRAINING

Operator training is provided by the field specialist following the completion of the video system configuration. Supplemental and refresher training is provided during scheduled site visits by the field specialist. ARS telephone support is always available. Site operators are trained on video system requirements and routine maintenance procedures, including:

- An overview of project and system components
- Power supply, distribution, and cabling
- Signal connectors and cabling

- Heater systems
- Component replacement
- Time-lapse recorder functions and operation
- On-site monitor operation
- Recorded videotape review
- Changing videotapes
- Completing log sheets
- Troubleshooting
- ARS contacts

A Time-Lapse Video Monitoring Field Procedures Notebook is also provided to site operators. This notebook contains technical instructions applicable to the specific camera monitoring equipment located at the site. Additional manufacturer's instruction booklets and pertinent maintenance documentation forms are also provided.

5.0 REFERENCES

Federal Communications Commission, April 1998, File Number 739592. (Figure 5-1).

Federal Communications Commission, April 1998, File Number 739591. (Figure 5-2).


 FEDERAL COMMUNICATIONS COMMISSION PRIVATE OPERATIONAL FIXED MICROWAVE RADIO STATION LICENSE												
LICENSEE				ASSOCIATED BROADCAST STATION		FILE NUMBER		CALL SIGN				
AIR RESOURCES SPECIALISTS INC 1901 SHARP POINT DR STE E FORT COLLINS CO 80525						739592		WPNM499				
RADIO SERVICE						STATION CLASS						
MW INDUSTRIAL/BUSINESS						FIXED						
EFFECTIVE DATE				CONSTRUCTION DATE		EXPIRATION DATE						
04/16/1998				10/16/1999		04/16/2008						
SPECIAL CONDITIONS OF GRANT:												
NONE												
SITES												
TRANSMITTER STREET ADDRESS				COUNTY				CITY		ST		
GARNER HILL LOCATED ON TOWERS SPUR				YUKON KOYUKUK				HEALY		AK		
SITE NO	LATITUDE	LONGITUDE	DATUM	ELEVATION (FT)	TIP HEIGHT (FT)	ANTENNA PAINTING & LIGHTING CODES FCC FORM 715/715A						
001	63-50-14.0 N	148-58-38.0 W	N83	1936	22							
002	63-51-21.0 N	148-56-58.0 W	N27	RECEIVER SITE								
FREQUENCY PATHS												
FREQUENCY AND POWER INFORMATION				PATH				SEGMENT INFORMATION				
FREQUENCY (MHZ) OR CHANNEL	TOLERANCE (%)	EMISSION DESIGNATOR	EIRP (DBM)	SEG NO	EMIT SITE NO	ANT HGT (FT)	BEAM- WIDTH (DEG)	HTxWD (FT)	POL	AZIM (DEG)	RECEIVER SITE NO	CALL SIGN
023175.000000	0.03000	25M0F8W	57.0	0001	1 001	15	1.6		V	33.4	002	WPNM498

Figure 5-1. FCC File Number 739592.

FEDERAL COMMUNICATIONS COMMISSION												
PRIVATE OPERATIONAL FIXED MICROWAVE RADIO STATION LICENSE												
LICENSEE AIR RESOURCES SPECIALISTS INC 1901 SHARP POINT DR STE E FORT COLLINS CO 80525				ASSOCIATED BROADCAST STATION		FILE NUMBER 739591		CALL SIGN WPNM498				
RADIO SERVICE MW INDUSTRIAL/BUSINESS						STATION CLASS FIXED						
EFFECTIVE DATE 04/16/1998				CONSTRUCTION DATE 10/16/1999				EXPIRATION DATE 04/16/2008				
SPECIAL CONDITIONS OF GRANT: NONE												
SITES												
TRANSMITTER STREET ADDRESS HEALY CLEAN COAL PROJECT POWER PLANT 4.2 MI ON YUKON KOYUKUK HEALY SPUR RD				COUNTY HEALY				CITY HEALY		STATE AK		
SITE NO	LATITUDE	LONGITUDE	DATUM	ELEVATION (FT)	TIP HEIGHT (FT)	ANTENNA PAINTING & LIGHTING CODES FCC FORM 715/715A						
001	63-51-21.0 N	148-56-58.0 W	N83	1304	94							
002	63-50-14.0 N	148-58-38.0 W	N27	RECEIVER SITE								
FREQUENCY PATHS												
FREQUENCY AND POWER INFORMATION				PATH		SEGMENT INFORMATION						
FREQUENCY (MHZ)	TOLERANCE (%)	EMISSION DESIGNATOR	EIRP (DBM)	SEG NO	EMIT SITE NO	ANT HGT (FT)	BEAM- WIDTH (DEG)	HTXWD (FT)	POL	AZIM (DEG)	RECEIVER SITE NO	CALL SIGN
021975.000000	0.03000	25M0F8W	57.0	0001	1 001	30	1.6		V	213.4	002	WPNM499

Figure 5-2. FCC File Number 739591.