


Complete in accordance with instructions on reverse and forward copy: TO: National Oceanic and Atmospheric Administration Office of Oceanic and Atmospheric Research 1315 East-West Highway SSMC-3 Room 11216 Silver Spring, MD 20910				Form Approved: OMB No. 0648-0025 Expires 03-31-08			
				NOAA FORM 17-4 (4-81)		U.S. DEPARTMENT OF COMMERCE NAT'L OCEANIC AND ATMOSPHERIC ADM.	
				INITIAL REPORT ON WEATHER MODIFICATION ACTIVITIES (P.L. 205, 92 ND , CONGRESS)			
1. PROJECT OR ACTIVITY DESIGNATION, IF ANY Idaho Power's Southern Idaho Cloud Seeding Project				2. DATES OF PROJECT			
3. PURPOSE OF PROJECT OR ACTIVITY Precipitation Enhancement/Snow Augmentation				a. DATE FIRST ACTUAL WEATHER MODIFICATION ACTIVITY IS TO BE UNDERTAKEN		11/01/2021	
				b. EXPECTED TERMINATION DATE OF WEATHER MODIFICATION ACTIVITIES		04/30/2022	
4. (a) SPONSOR				4. (b) OPERATOR			
NAME Idaho Power Company				NAME Same			
AFFILIATION Self		PHONE NUMBER (208) 388-2200		AFFILIATION		PHONE NUMBER	
STREET ADDRESS 1221 W Idaho St.				STREET ADDRESS			
CITY Boise		STATE ID	ZIP CODE 83702	CITY		STATE	ZIP CODE
5. TARGET AND CONTROL AREAS (See Instructions)							
TARGET AREA				CONTROL AREA			
LOCATION Payette, Boise, and Wood Basins		SIZE OF AREA 424 SQ.MI		LOCATION 2-3 SNOTEL sites to NW and N		SIZE OF AREA Point SQ.MI.	
6. DESCRIPTION OF WEATHER MODIFICATION APPARATUS, MODIFICATION AGENTS AND THEIR DISPERSAL RATES, THE TECHNIQUES EMPLOYED, ETC. (See Instructions)							
1. Ground-based generators: 33 units operating from locations indicated on project maps. a. Agent for 32 generators: Silver iodide (AgI) at 20 g/hr via acetone carrier and propane flame. b. Agent for 1 generator: Liquid Propane (test generator that will vary dispersal rates for testing purposes)							
2. Airborne: 2 Aircraft operating from BOI equipped with 150 g end-burning and 20 g ejectable flares. a. Agent: Silver iodide							
3. Rawinsonde located near Crouch, ID. Two radiometers, located on Squaw Butte, ID and Hill City, ID.							
7. LOG BOOKS: Enter name, affiliation, address, and telephone number of responsible individual from whom log books or other records may be obtained.							
NAME Derek Blestrud				THIS REPORT IS REQUIRED BY PUBLIC LAW 92-205; 85 STAT 735; 15 U.S.C. 330b. KNOWING AND WILLFUL VIOLATION OF ANY RULE ADOPTED UNDER THE AUTHORITY OF SECTION 2 OF PUBLIC LAW 92-205 SHALL SUBJECT THE PERSON VIOLATING SUCH RULE TO A FINE OF NOT MORE THAN \$10,000, UPON CONVICTION THEREOF.			
AFFILIATION Idaho Power Company		PHONE NUMBER (208) 388-5899					
STREET ADDRESS 1221 W Idaho St. (Mail to: CHQ-6 PO Box 70 (83707))							
CITY Boise		STATE ID	ZIP CODE 83702				
8. SAFETY AND ENVIRONMENT							
<input type="checkbox"/> YES		<input checked="" type="checkbox"/> NO		Has an Environmental Impact Statement, Federal or State been filed? If yes, please furnish a copy as applicable.			
<input checked="" type="checkbox"/> YES		<input type="checkbox"/> NO		Have provisions been made to acquire the latest forecasts, advisories, warnings, etc. of the National Weather Service, Forest Service, or others when issued prior to and during operations? If yes, please specify on a separate sheet.			
<input checked="" type="checkbox"/> YES		<input type="checkbox"/> NO		Have any safety procedures (operational constraints, provisions for suspension of operations, monitoring methods, etc.) and any environmental guidelines (related to the possible effects of the operations) been included in the operational plans? If yes, please furnish copies or a description of the specific procedures and guidelines.			
9. OPTIONAL REMARKS (See Instructions. Use Separate Sheet.)							
NAME Derek Blestrud				CERTIFICATION: I certify that the above statements are true, complete and correct to the best of my knowledge and belief.			
AFFILIATION Idaho Power Company				SIGNATURE 			
STREET ADDRESS 1221 W Idaho St. (Mail to: CHQ-6 PO Box 70 (83707))				OFFICIAL TITLE Senior Atmospheric Scientist			
CITY Boise		STATE ID	ZIP CODE 83702	DATE 11/07/2021		PHONE NUMBER (208) 388-5899	

Attachment to accompany NOAA Form 17-4, Nov. 2021
Idaho Power Company Weather Resources Management Project
Payette, Boise, Wood, and Upper Snake River Basins

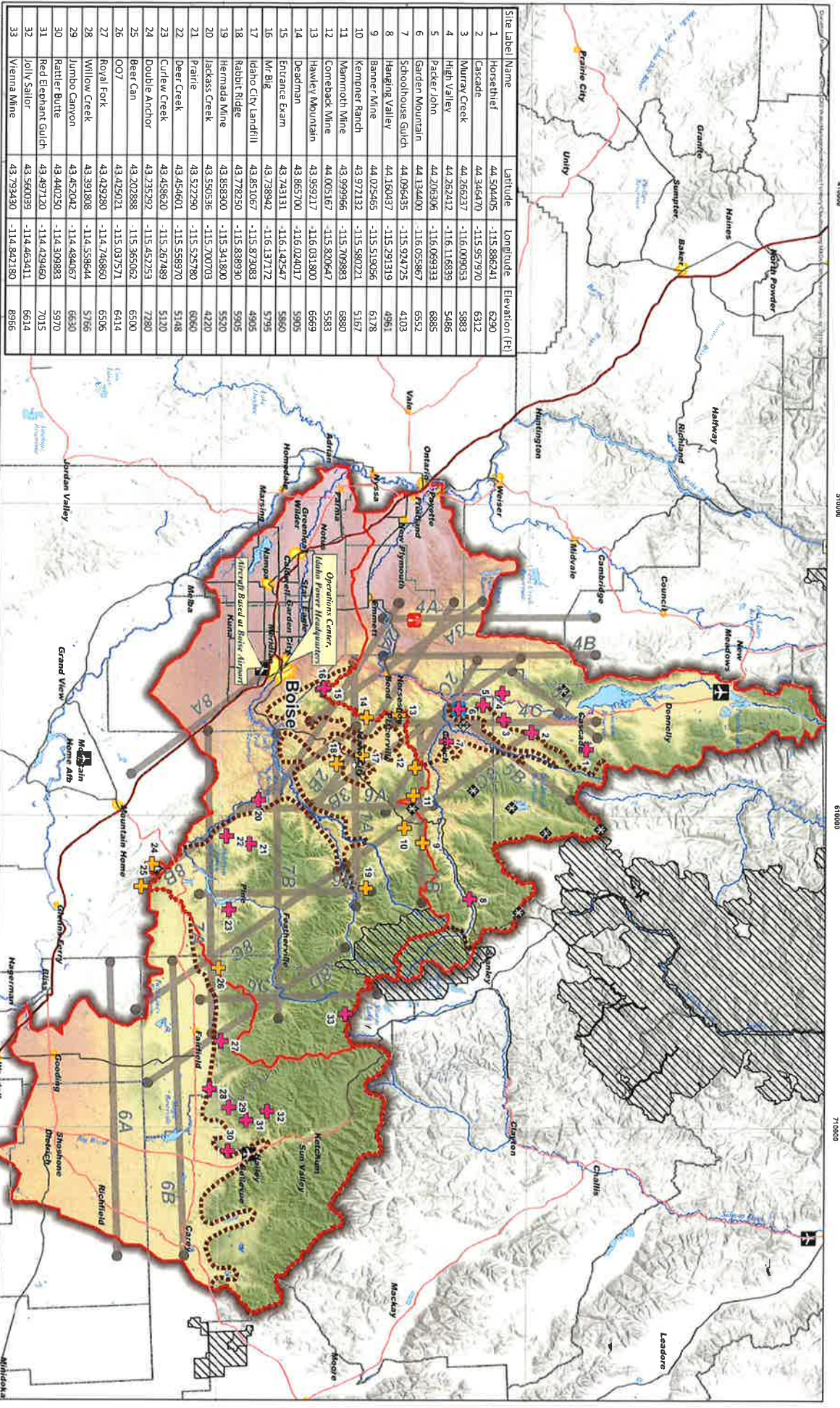
Item 4: Addresses

Street Address: 1221 West Idaho Street Boise, ID 83702	Mailing Address: Water Management Dept. – CHQ-4 P.O. Box 70 Boise, ID 83707
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Item 5: Target/Control:

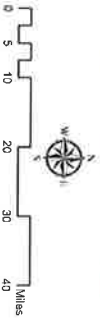
Not a target – control program; project evaluation to be done by computer assessment of annual runoff.

- Item 8. 1. No Environmental Impact Statement required.
2. In addition to the wealth of information available via the internet, Idaho Power Company operates a high resolution Weather Research and Forecasting model that is used for case guidance.
3. Suspension criteria satisfying the constraints listed below (extracted from the overall Project plan and abbreviated for inclusion here):



Site Label	Name	Latitude	Longitude	Elevation (ft)
1	Horsethief	44.504405	-115.886241	6290
2	Cascade	44.346470	-115.857970	6312
3	Murray Creek	44.266237	-116.009533	5883
4	High Valley	44.262412	-116.116839	5466
5	Packer John	44.206306	-116.089333	6885
6	Garden Mountain	44.134400	-116.035867	6552
7	Schoolhouse Gulch	44.096435	-115.924725	4203
8	Hanging Valley	44.160437	-115.291319	4961
9	Banner Mine	44.025465	-115.519956	6178
10	Kemmer Ranch	43.972132	-115.580721	5167
11	Mannoth Mine	43.999966	-115.709883	6880
12	Cornback Mine	44.005167	-115.820647	5583
13	Hawley Mountain	43.959217	-116.031800	6669
14	Deadman	43.865700	-116.024017	5995
15	Entrance Exam	43.743131	-116.142547	5860
16	Mt. Big	43.738942	-116.137172	5795
17	Idaho City Landfill	43.851067	-115.872083	4905
18	Rabbit Ridge	43.778250	-115.839890	5905
19	Hermada Mine	43.898300	-115.941800	5520
20	Jackass Creek	43.59536	-115.700703	4220
21	Prairie	43.522290	-115.525780	6060
22	Peer Creek	43.454601	-115.558970	5148
23	Curlew Creek	43.458620	-115.267489	5120
24	Double Anchor	43.235292	-115.482753	7280
25	Beer Can	43.202888	-115.365062	6500
26	CO7	43.425021	-115.037571	6414
27	Royal Fork	43.429280	-114.768660	6506
28	Willow Creek	43.391808	-114.558644	5766
29	Jumbo Canyon	43.452042	-114.484667	6630
30	Rattler Butte	43.440250	-114.309883	5970
31	Red Elephant Gulch	43.497120	-114.429460	7015
32	Jolly Sailor	43.560039	-114.463411	6614
33	Verma Mine	43.792430	-114.892180	8966

CM Project Map
 Date: 10/30/2019
 UTM, NAD83, Zone 11 Grid Coordinates



Any well-designed and responsibly conducted weather modification program includes guidelines for temporarily suspending or completely stopping cloud seeding when certain conditions exist.

This safeguard is intended to avoid contributing to or to give the perception of contributing to, runoff or reservoir levels beyond manageable limits, whether it is a real or perceived hazardous situation. Other hazardous situations include, but may not be limited to, flooding, excessive erosion and sedimentation buildup, and avalanches resulting from natural meteorological or hydrological phenomena. IPC created a list of triggers that it would monitor to determine whether cloud seeding operations should be suspended. These triggers include (and are discussed in detail below):

- Total snowpack
- Potential flood situations (including rain-on-snow)
- Severe weather threats, including tornadoes, locally heavy precipitation, strong or damaging winds, hail, or lightning
- Surface Water Supply Index
- Avalanche conditions
- Special circumstances

Assessing these triggers is a routine facet of ongoing forecasting and cloud seeding activities. The time needed for making decisions and acting on these parameters is shorter than commonly used in routine assessments.

These triggers are monitored on a storm-by-storm and moment-to-moment basis during rapidly changing weather conditions. National Weather Service (NWS) Flash Flood or Severe Weather Warnings pertinent to a target area, its drainage area, or even adjacent watersheds can trigger suspension of cloud-seeding operations. While suspending cloud seeding ahead of a severe weather threat is typically infrequent and short-lived, suspensions during potential flood situations might span several days or terminate cloud seeding for the remainder of the season. Special circumstances such as search and rescue missions, avalanche threats, or other emergencies within or near a target area may result in temporarily curtailing seeding operations, as IPC deems prudent.

Suspensions can be called for all or part of a basin, based upon deduced threat. An example of this might be that there is a flood warning for Weiser River near Weiser, Idaho; the northern generators in the Payette Basin may be suspended until the threat passes, but the southern generators located in the Payette Basin may remain active to focus augmentation the eastern Payette Basin and the Boise Basin.

Total snowpack

Snowpack can begin as early as October and continue through April and sometimes into May. A hazard potential from snowmelt exists after excessive snow accumulations because it creates unmanageable runoff or it creates flood-stage runoff. Therefore, certain percentages of April first's basin-wide average water content are used as cutoff criteria for seeding operations.

Total snowpack status is evaluated from data gathered by other agencies such as the Natural Resources Conservation System (NRCS), snow survey, and snow pillow data. Table 1 lists these

percentages. Once suspended, the program may resume seeding operations if subsequent snow survey or snow pillow data indicate the accumulation has fallen below these percentages.

Date	Cut-off value (percentage of April 1 average)
January 1	95%
February 1	110%
March 1	125%
April 1	140%

Table 1 - Snowpack levels that would suspend seeding

Surface Water Supply Index (SWSI)

A Surface Water Supply Index (SWSI) is a predictive indicator of the surface water available in a basin compared to historic supply. The SWSI is calculated by summing the two major sources of irrigation water supply; reservoir carryover and spring and summer streamflow runoff. These two sources are analyzed together when determining the total surface water supply available for the season.

	Boise
Jan	2.3
Feb	2.1
Mar	1.9
Apr	1.8

Error! Reference source not found.2 lists the SWSI values of concern for the different basins.

Rain-induced winter floods

IPC will take every precaution to ensure timely suspension of operations during these situations, because of the potential for flooding. Suspending operations under these conditions is intended to limit the effect of seeding when any increase in precipitation might contribute to the potential flood hazard or be perceived to do so. Seeding will be suspended when any of the criteria listed in Table 2 or Table 3 are met or forecast to occur within 24 hours.

River flow and encroachment forecasts are based upon information and predictions supplied by the NWS, Northwest River Forecast Center (NWRFC), USGS, and IPC. Both NWRFC and IPC use a stream flow model that predicts the inflow to Brownlee Reservoir and other upper Snake River locations, as well as tributaries of the system. Primary input to the model includes existing basin wetness and a Quantitative Precipitation Forecast (QPF). These forecasts are extremely sensitive to predicted condensate supply rates and temperatures. Suspension of seeding will occur whenever the NWS, NWRFC, or IPC forecasts exceed these criteria.

To provide an added level of caution during possible flood situations, seeding can be suspended at the discretion of IPC meteorologists and when indicated by the QPF. Suspension can occur even if criteria are not explicitly met.

Central Mountains - Winter flooding from excessive rainfall is possible in the Central Mountains. A large portion of the basin lies below 4,500' elevation and frequently receives rain rather than snow. Sometimes, heavy rain falls well above the 4,500' contour.

Error! Reference source not found.3 shows several river locations that are monitored to determine whether cloud seeding operations should be suspended. Seeding will be suspended when any of the criteria listed in **Error! Reference source not found.**3 are met or forecast to occur within 24 hours.

Location	USGS Gauge Identification	Flood Stage (GH – feet)	Flood Discharge (cfs)
Weiser River near Weiser	13266000	9.5	8,890
Snake River at Weiser	13269000	12	67,560
South Fork Payette at Lowman	PRL11	7.5	7,205
Payette River near Emmett	13249500	10.51	16,000
Boise River at Glenwood Springs	13206000	10.31	7,000
Big Wood River at Hailey	13139510	6	4,150
Little Wood near Carey	13148500	6	1,660

Table 3 – Central Mountains: Critical river stages

Severe Weather Warnings

Seeding operations will be suspended whenever the NWS issues a severe weather warning for a cloud seeding region. This includes warnings for adjacent areas if the weather activity prompting the warning is likely to move into a cloud seeding region.

Usually warnings are issued when strong convective activity is expected. The official criteria are heavy local rainfall, winds at 50 knots (60 mph or higher) or if the winds cause observed damage, large hail (hailstones $\frac{3}{4}$ inches in diameter or larger), tornadoes, or funnel clouds.
Other Special Circumstances

IPC has the authority to suspend or terminate seeding activities under any special or unusual circumstances that may be deemed hazardous or might be perceived to be so by the public. Examples of special circumstances are extreme avalanche hazard as reported in United States Forest Service USFS avalanche status bulletins, very strong winds, unusually warm temperatures, heavy snow at low elevations, or other unforeseen circumstances.

Note: If suspension criteria are met during a seeding period, IPC will stop seeding operations immediately.