Exhibit: Detailed Purpose of Experiment

Applicant: Rainmaker Technology Corporation

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1. Background and Primary Purpose

Rainmaker submits this document to provide a detailed explanation of the scientific purpose and operational rationale for atmospheric research scheduled October 1, 2026 through March 31, 2027, to be conducted in the Pendleton, Oregon region.

The primary objective of this campaign is to test scanning methods and software improvements in the validation of cloud seeding effects in a natural orographic cloud environment. The central scientific question motivating this campaign is: Are we emitting a sufficiently high concentration of active ice nuclei, suspended long enough in cloud, for a sufficiently long period, to create a measurable perturbation detectable by scanning cloud radar?

To answer this question, the campaign will deploy the ProSensing KASPR scanning Ka-band polarimetric cloud radar, UAV-based seeding platforms, and a suite of supporting surface and upper-air instrumentation to detect, characterize, and quantify radar signatures attributable to seeding-induced glaciation events in natural orographic cloud systems.

Example of the KASPR system

2. Technical and Operational Justification

Rainmaker has selected the ProSensing KASPR Ka-band (35.29 GHz) scanning polarimetric cloud radar as the primary detection asset for this campaign based on several critical technical advantages over conventional operational weather radar:

- **Cloud sensitivity:** Standard operational weather radar (NEXRAD, S-band) has a detection threshold of approximately –5 to +10 dBZ at range, making it incapable of detecting the early-stage glaciation signatures produced by cloud seeding operations. Pure liquid clouds and early ice nucleation produce reflectivity values in the range of –40 to –10 dBZ, well below NEXRAD's detection floor. The KASPR uses a solid-state transmitter with pulse compression to achieve high sensitivity at low peak power, reaching approximately −40 dBZ at 1 km range with 25 m range gate spacing in scanning mode, providing the margin necessary to observe glaciation onset as soon as it begins downwind of the seeding site. This exceptional sensitivity is the primary motivation for deploying a dedicated cloud radar rather than relying solely on NEXRAD.

- **Scanning capability:** The KASPR is mounted on an elevation-over-azimuth positioner on the roof of its 20-ft equipment shelter, supporting continuous azimuth rotation from 0° to 360° and elevation scanning from –90° to +90°. This enables the full suite of scan modes required by the campaign: vertically-pointing operation for continuous time-height profiling of cloud top and base; Range-Height Indicator (RHI) scans along the expected seeding plume advection direction; and Plan Position Indicator (PPI) scans to map the horizontal extent of seeding signatures. The system's 0.5° beam width (with 1.2 m antenna), 15–200 m range resolution (30 m typical), and 0.04 m/s velocity resolution allow high-cadence, fine-resolution tracking of the seeding plume as it advects downwind, which is essential for isolating and attributing any observed radar signature to seeding activity rather than natural cloud variability.
- **Full polarimetric capability:** The KASPR provides pulse-to-pulse switchable horizontal and vertical transmit polarization combined with simultaneous H- and V-polarization linear reception. This architecture enables computation of the full suite of polarimetric variables — differential reflectivity (ZDR), specific differential phase (KDP), copolar correlation coefficient (ρhv), and linear depolarization ratio (LDR) — along with full Doppler spectra. These polarimetric variables provide direct microphysical information on cloud particle phase, habit, orientation, and size distribution, critical for distinguishing seeding-induced ice formation from background liquid cloud and for characterizing the microphysical progression from ice nucleation through crystal growth and aggregation within the seeding plume.
- **Detection of unambiguous seeding signatures:** The scientific literature for AgI-based campaigns documents seeding-induced reflectivity perturbations (ΔZe) of 10–30 dBZ above background in low-precipitation orographic cloud (French et al., 2018; Friedrich et al., 2020), with a minimum detectable ΔZe of approximately 5 dBZ in precipitating conditions (Zaremba et al., 2024). The KASPR's sensitivity of approximately −40 dBZ at 1 km provides a substantial margin above the pre-seeding liquid cloud background, enabling reliable detection of signatures across this expected range.
- **Operational suitability:** The KASPR is housed in a reinforced 20-ft ISO container providing an integrated, air-conditioned equipment shelter with uninterruptible power supply, remote-controlled power distribution, mission control computer, and RF chillers — a configuration designed for unattended long-term operation at remote deployment sites. Its configurable maximum measuring range of approximately 30 km provides the spatial coverage needed to track seeding plumes from dispersal through downwind precipitation development. Total system power requirements — approximately 5 kVA for

the radar plus 6 kVA for environmental conditioning and auxiliary equipment — are supplied by a single 208/240 VAC, 60 Hz, 100 A single-phase service line, compatible with either utility power or generator supply at the deployment site.

3. Strategic Significance and Public Interest

- **Drought relief and water resource management:** Rainmaker provides cloud seeding services to state governments and water resource agencies facing the consequences of prolonged drought. Deploying a calibrated, scanning cloud radar system enables the observational evidence base needed to demonstrate operational efficacy to clients and regulatory authorities alike.
- **Advancing the scientific foundation of cloud seeding:** The deployment of the KASPR in this campaign will generate radar-validated observational datasets, providing the evidentiary basis required to support future operational approvals.
- **Regulatory compliance:** Conducting field testing with clearly defined go/no-go criteria, a calibrated and well-characterized radar system, and a formal Observation of Seeding Effect (OSE) detection framework is essential to demonstrating to regulatory authorities that seeding operations meet the scientific and safety standards required for broader operational deployment.