

Please review all of the following information, including the gear allocations and field team information, to ensure accuracy. This plan is an agreement between CH2M HILL Polar Services (CPS) and your group, documenting the logistics support you will receive.

## PROJECT INFORMATION

<b>Lead Principal Investigator</b>	Meredith Hastings
<b>Institute</b>	Brown University, Geological Sciences
<b>Project Title / Grant #</b>	Collaborative Research: The impact of bromine chemistry on the isotopic composition of nitrate at Summit, Greenland (0909374)
<b>NSF Program and Manager</b>	NSFOD\OPP\ARC\ANS, Dr. Henrietta Edmonds
<b>PFS Project Manager</b>	Katrine Gorham

## LOGISTICS SUMMARY

Researchers on this collaborative project--0909374 (Hastings, Brown U, LEAD), 0908186 (Huey, GA Tech.) and 0908588 (Dibb, UNH)--will study the influence and connection between halogen and nitrogen oxide chemistry at Summit, Greenland. Scientists will conduct two ~six week field efforts at Summit to collect samples for further study at the home institutions.

In mid May 2010, five researchers will travel to Summit, Greenland, to begin a ~six week period of field work for the project. They will work in a satellite camp established in the Clean Air Sector, travelling to and from the camp on foot or via electric vehicle when possible. The team will take measurements of the atmosphere above the snowpack and collect snowpack samples for analysis of the isotopic composition of nitrate. After about three weeks, two additional team members will arrive. By the end of a ~five-day turnover period, three of the original members will have departed, and the experiment will continue for another ~two weeks, with one additional personnel change. The team will depart Summit on June 25th, and subsequently return to the U.S.

Snow samples collected at Summit will be packed into ISC boxes and prepared for shipment by the researchers (PI will supply ISC boxes and eutectics). While at Summit it will be the researchers' responsibility to ensure that the samples remain at the proper temperature. At the end of the campaign, samples will be flown from Summit to Kangerlussuaq, where they will be stored in a freezer facility before being flown to Stratton Air Base in New York. The PI will make arrangements for the samples to be retrieved in NY (meeting the plane on the flight day) and shipped onward to the home institutions.

The researchers will complete a similar ~6-week sampling campaign in June/July 2011. Four to five people will be on-site at any one time, with a turnover period in early July when six people will be on site.

CPS will provide ANG coordination for pax and cargo, in-transit user days in Kangerlussuaq, access to the Summit infrastructure, gases, and deployment of satellite camp structures for the clean air sector sampling. The PIs will make all other arrangements and pay for them through the grant.

For the complete CPS online project record for this grant, including science objectives, go to:  
[http://www.polar.ch2m.com/arlss\\_reports/arlss\\_projectsdetail.asp?cbPropNum=0909374](http://www.polar.ch2m.com/arlss_reports/arlss_projectsdetail.asp?cbPropNum=0909374)

For up-to-date information on the project's schedule, please view the online Greenland calendar  
<http://www.polar.ch2m.com/>> Greenland > Calendars/Schedules).

## OUTSTANDING ACTIONS AND NOTES

Issue	Responsibility	Date Due	Date Completed
Review support plan for accuracy and distribute to all field team members	PI	4/10/2010	In progress
Obtain all necessary insurance required for fieldwork under the Summit group permit	PI	4/10/2010	In progress
Visit all hyperlinks and review all documents referred to in the support plan	Entire Field Team	4/10/2010	In progress
Contact the GEOSummit Science Coordination Office (SCO) <a href="http://sco.at.summitcamp.org">sco at summitcamp.org</a> regarding your project's plans for the season	PI	4/10/2010	Completed
Complete medical clearance process 6-8 weeks before desired deployment date	Entire field team	4/10/2010	In progress
Complete Critical Success Factors		4/10/2010	In progress
<b>Note: Passports are required for Air National Guard and international travel. Also, please bring TWO copies of your passport to Greenland with you.</b>	Entire field team PI	4/10/2010	Okay

## ALLOCATIONS AND SERVICES

### Allocations from Inventory

Quant/Unit	Item
1	First Aid Kit
1	Fire Extinguisher
1	VHF Radio Base Station and Radio
1	Microwave oven
1	Coffee and hot water maker
1	Water Cooler
1	Waste Baskets
1	Broom and dustpan
3	Tables
6	Chairs

### Other Services

Service	Comments
User days Kangerlussuaq	
User days Summit, including meals	Personnel will use the Big House facilities for meals and observe regular meal times. They should notify the camp manager and chef if they plan to eat outside normal meal times. Any special diets or food allergies should be reported to the chef upon arrival at Summit. If possible, the science group can send an early email to <a href="mailto:manager@summitcamp.org">manager at summitcamp.org</a> to prep the cook for special diet requirements.
ANG travel: NY-Kanger-Summit-Kanger-NY	
Cargo Services	Includes frozen shipment of snow samples Summit > Scotia.
Gas Cylinder procurement and delivery: 3 cylinders of UHP O2 (Georgia Tech) 2 cylinders of Zero Air (Georgia Tech) 27 cylinders of UHP N2 (Georgia Tech) 2 UHP He (UNH)	CPS will procure and stage gas at the facility for the researchers' use.

Sat Camp facility	Prior to arrival of the field team, the Sat Camp facility will be set up approximately 1 km south of the main camp near the E-W clean air boundary. The Tomato will serve as office space for the field team. The Bally building will serve as laboratory space and will be located approximately 100 m south of the Tomato, against the E-W clean air boundary. Both structures will be connected to power.
Clean Air Sector Management Protocol	Summit personnel will observe clean air protocols. The camp manager will notify the science team of north wind operations and complete appropriate paperwork as needed.

## LOCATION INFORMATION

Please visit <http://www.polar.ch2m.com/> and navigate to the Greenland menu for en route and location-specific Greenland information. Prior to deployment, your entire field team should be familiar with the content of the *Greenland Guide* and, if traveling to Summit, with the guidelines provided in the *Summit Users' Guide*. Both are available electronically via our Web site's Greenland menu.

## CARGO AND CUSTOMS

All cargo required for your project should arrive in Scotia, NY, **no later than 2 weeks prior** to the desired northbound Air National Guard (ANG) flight, must be entered into our online Cargo Tracking System, and must be properly registered with Customs.

For the most current ANG flight schedule go to <http://www.polar.ch2m.com/> and navigate to Greenland > Calendars/Schedules.

If you are a **new user** requiring access to the Cargo Tracking System, contact [Jason Buenning](#).

(If you need **technical support** with the Cargo Tracking System, contact [Mike Dover](#) .

Customs instructions are available on our Web site at <http://www.polar.ch2m.com/> (go to Greenland > Customs). More information is available via the *Greenland Guide*, under Greenland on the CPS site.

The following is our current understanding of your overall cargo requirements:

### Cargo List

Items	Weight/Cube
GATech Red NOx Instrument (C-5)	350 lbs / 29 cu ft
GATech Black NOx Instrument (C-5)	150 lbs / 17.5 cu ft
GaTech (4) Gray Boxes (C-5)	800 lbs / 45.6 cu ft
UNH/Brown Instruments (C-130)	2500 lbs / 150 cu ft
GATech Instruments (C-130)	1500 lbs / 100 cu ft
GATech (4) compressed gas cylinders (C-130)	240 lbs / 8.8 cu ft
GATech (6) grey Hardigg boxes (C-130)	900 lbs / 72 cu ft
GATech (1) red box (C-130)	350 lbs / 16 cu ft
GATech (2) black cases (C-130)	500 lbs / 51 cu ft

**SUPPORT SCHEDULE**

Approx Date	Location	Activity
Apr 1	Stewart ANGB	Shipping deadline for cargo bound for Summit via C-5
April 26	Stratton ANGB	Shipping deadline for cargo bound for Summit via C-130
May 10	Kangerlussuaq	Cargo from Scotia to Kangerlussuaq
May 10	Kangerlussuaq	First phase field team of five arrive in Kangerlussuaq
May 12	Summit	First phase field team of five arrive at Summit
June 2	Kangerlussuaq	Second phase field team of two arrive in Kangerlussuaq
June 4	Summit	Second phase field team of two arrive at Summit
June 4-9	Summit	First-Second phase field team transition period
June 4	Kangerlussuaq	Tanner from first phase field team leaves Summit
June 7	Stratton ANGB	Tanner returns to NY via ANG on Southbound rotator flight
June 9	Kangerlussuaq	Mewes and Dibb from first phase field team leave Summit
June 10	Stratton ANGB	Mewes and Dibb return to NY
June 21	Kangerlussuaq	Huey arrives in Kangerlussuaq
June 23	Summit	Huey arrives at Summit
June 23	Kangerlussuaq	Fibiger leaves Summit. Note: Personal travel and accommodations will be the responsibility of Fibiger between arrival at Kangerlussuaq and departure on July 1.
June 25	Kangerlussuaq	Second phase field team leaves Summit
June 26	Stratton ANGB	Field team (4) return to NY via ANG on Southbound rotator flight.
July 1	Stratton ANGB	Fibiger returns to NY.

For the most up-to-date information on the project's schedule, please view the online Greenland calendar (<http://www.polar.ch2m.com/> > Greenland > Calendars/Schedules).

**FIELD TEAM INFORMATION**

Name	Location	Date In	Date Out	Email
Jack Dibb	Kangerlussuaq	5/10/2010	6/10/2010	<a href="mailto:jack.dibb@unh.edu">jack.dibb@unh.edu</a>
	Summit	5/12/2010	6/9/2010	
Greg Huey	Kangerlussuaq	6/21/2010	6/26/2010	<a href="mailto:greg.huey@eas.gatech.edu">greg.huey@eas.gatech.edu</a>
	Summit	6/23/2010	6/25/2010	
David Tanner	Kangerlussuaq	5/10/2010	6/7/2010	<a href="mailto:kdtanner1@yahoo.com">kdtanner1@yahoo.com</a>
	Summit	5/12/2010	6/4/2010	
Dorothy Fibiger	Kangerlussuaq	5/10/2010	7/1/2010	<a href="mailto:dorothy_fibiger@brown.edu">dorothy_fibiger@brown.edu</a>
	Summit	5/12/2010	6/23/2010	
Jeff Shook	Kangerlussuaq	5/10/2010	6/26/2010	<a href="mailto:jshook6@gatech.edu">jshook6@gatech.edu</a>
	Summit	5/12/2010	6/25/2010	
Danja Mewes	Kangerlussuaq	5/10/2010	6/10/2010	<a href="mailto:danja@gatech.edu">danja@gatech.edu</a>
	Summit	5/12/2010	6/9/2010	
Zach Luna	Kangerlussuaq	6/2/2010	6/26/2010	<a href="mailto:zluna3@gatech.edu">zluna3@gatech.edu</a>
	Summit	6/4/2010	6/25/2010	
Chelsea Corr	Kangerlussuaq	6/2/2010	6/26/2010	<a href="mailto:Ccorr@gust.sr.unh.edu">Ccorr@gust.sr.unh.edu</a>
	Summit	6/4/2010	6/25/2010	

**PROJECT CONTACT INFORMATION**
**Research Team**

Role	Name	Email	Phone / Fax
Principal Investigator	Meredith Hastings	<a href="mailto:meredith_hastings_at_brown.edu">meredith_hastings_at_brown.edu</a>	401 863.3658 /
Collaborator	Jack Dibb	<a href="mailto:jack.dibb_at_unh.edu">jack.dibb_at_unh.edu</a>	603 862.3063 /603 862.2124
Collaborator	L. Greg Huey	<a href="mailto:greg.huey_at_eas.gatech.edu">greg.huey_at_eas.gatech.edu</a>	404 894.5541 /404 894.6285

**CPS Team Members**

Contact for	Name	Email	Primary Phone
Summit science planning & support	Katrine Gorham	<a href="mailto:Katrine_at_polarfield.com">Katrine_at_polarfield.com</a>	Denver: 303.349.2884
Greenland science planning & support	Susan Zager	<a href="mailto:Susan_at_polarfield.com">Susan_at_polarfield.com</a>	Denver: 720.320.6159
Greenland science planning & support	Robin Abbott	<a href="mailto:Robin_at_polarfield.com">Robin_at_polarfield.com</a>	Denver: 303.748.8507
Kangerlussuaq base operations	Kathy Young	<a href="mailto:Kathy_at_polarfield.com">Kathy_at_polarfield.com</a>	Denver: 720.320.6160 Greenland: 011.299.524218
Scotia (Stratton Air Base) operations & customs	Earl Vaughn	<a href="mailto:Earl_Vaughn_at_gmail.com">Earl_Vaughn_at_gmail.com</a>	Scotia cell: 518.605.0979
Medical/Dental Clearance (PQ)	Robbie Score	<a href="mailto:Robbie_at_polarfield.com">Robbie_at_polarfield.com</a>	Denver: 303.906.0093

**CPS Offices**

Denver	Kangerlussuaq	Scotia
Polar Field Services 8110 Shaffer Parkway Suite 150 Littleton, CO 80127 Tel: 303.984.1450/1439 Fax: 303.984.1445	CH2M HILL Polar Services Attn: Name of Employee/Researcher Postboks 1015 DK-3910 Kangerlussuaq, Greenland Tel: 011.299.841598 Fax: 011.299.841599	Earl Vaughn C/O 109 <sup>th</sup> Aerial Port Bldg. 20 Stratton Air Base Scotia, NY 12302-9752 Tel: 518.344.2635 Cell: 518.605.0979 Fax: 518.344.2537

**Summit Station**

Winter	Summer
Polar Field Services Attn: Name of Employee/Researcher 8110 Shaffer Parkway Suite 150 Littleton, CO 80127 Tel: 303.984.1450/1439 Fax: 303.984.1445	CH2M HILL Polar Services Attn: Name of Employee/Researcher - Summit Station C/O Earl Vaughn 109 <sup>th</sup> Aerial Port Bldg. 20 Stratton Air Base Scotia, NY 12302-9752 Tel: 518.344.2635 Fax: 518.344.2537

**Other**

Organization	Internet	Phone
Medical Advisory Services (MAS)	<a href="http://followup_at_MedAire.com">followup_at_MedAire.com</a>	Worldwide Phone 480.333.3876
Summit Science Coordination Office (SCO)	<a href="http://www.geosummit.org">http://www.geosummit.org</a> <a href="mailto:sco_at_summitcamp.org">sco_at_summitcamp.org</a>	John Burkhart +47 96 82 5011

## SAFETY, ENVIRONMENT, HEALTH and PERMITS

Effective January 1, 2010 the Government of Greenland assumed responsibility for the permitting process for research in Greenland. Projects at Summit Station will be covered by a group permit.

### Medical Clearance

Arctic Program participants traveling into the Greenland field generally must pass a National Science Foundation-mandated physical and dental exam. All field team members should plan to complete their Physical Qualification (medical and dental clearance) process 6-8 weeks prior to travelling to Greenland. For more information, refer to CPS' *Greenland Guide*, available at <http://www.polar.ch2m.com/> under Greenland.

### Risk Assessment

Many projects require a risk assessment, a collaborative process between the research team and the support team. Your research assessment is included as an appendix. Please contact Katrine if you have questions.

## CRITICAL SUCCESS FACTORS

Please list the factors that are most important for the success of your science. We track these factors in order to measure the success of CPS' support. Examples might be the availability of the helicopter or camp gear.

Factors
Permission to sample in Clean Air Sector and to keep the surface snow area clear of any vehicle or foot traffic.
Power to the Tomato and Bally Building for CIMS system, Mist Chamber system, Milli-Q water system, computers.
Furniture (Tables, Chairs) in the Tomato for field team members' use.
Effort by camp staff to alert scientists in the Clean Air Sector when the wind is blowing toward the Clean Air Sector and camp activities cannot be modified to diminish the impact of local emissions.
Availability of safety equipment onsite, if needed.
Return of frozen samples from Summit to Schenectady, NY (via Kangerlussuaq).

## GOVERNMENT AND PERFORMANCE REPORTING ACT OF 1993 (GPRA)

NSF/OPP requires your help in complying with the Government Performance and Reporting Act of 1993 (GPRA). One measure of CPS' performance is a "facility-performance metric" which counts the number of productive days your project has in the field while relying on CPS facilities or support. Please keep track of any "lost days" and report these to us at the end of the season.

## APPENDIX

### RISK FACTORS and MITIGATION

Factor	Mitigation and Control
Foot/ski travel	-Have a communication plan in place (carry a radio) -Have a check out policy in place
Gas Cylinder Handling	- Review Haz Comm - Review MSDS (Material Safety Data Sheet)
Heavy lifting/body strains and sprains	-Use proper lifting techniques
High Altitude	-Participate in high altitude training -Have medical call in service available -Have SAR plan in place

	<ul style="list-style-type: none"> <li>-Have oxygen available in high altitude camps</li> <li>-Develop plan to acclimatize</li> <li>-Consult with physician on use of medication for acclimatization</li> </ul>
Medical fitness for remote work outside ANG flight period	-Follow NSF Physical Qualification process
Power Tools	<ul style="list-style-type: none"> <li>-Participate in a power tools training</li> <li>-Review current AHA (Activity Hazard Analysis)</li> </ul>
Snowmobile Travel	<ul style="list-style-type: none"> <li>-Participate in a snowmobile training</li> <li>-Use appropriate Personal Protection Equipment/helmets</li> </ul>
Structure Fire	-Maintain appropriate fire extinguisher units for building
Cold Related Injuries-weather	<ul style="list-style-type: none"> <li>-Wear proper clothing</li> <li>-Appropriate camping gear, insure sleeping bags are adequately rated</li> <li>-Check the forecast before going out of camp/town</li> <li>-Watch the weather while out</li> <li>-Be mindful of hydration, carry sufficient food</li> <li>-Develop and share your travel plans</li> <li>-Have and share an emergency plan for bad weather</li> </ul>
Emergency Plan	-Compile a list of emergency contacts for your field team and share it with critical participants including your home institution and CPS.