

To: VLBA Science Review  
From: George Seielstad

Subject: NE VLBA Antenna

I shall restate the factors I believe make Green Bank the optimum site for so-called "Northeast" VLBA Antenna.

1) Logistics.

Green Bank would be the easiest of any of the ten sites to open. This is significant because the VLBA's experience has been that the cost, time, and difficulty of acquiring every other site has exceeded expectations.

GB, once opened, would also be the best supported by NRAO employees. The full mix of talents needed to run a telescope exists here, already hired by the same organization that will operate the VLBA.

The VLBA gains if these people are connected with the project in any way, and the connection is very tenuous once the instrument is over the horizon (out of sight, out of mind).

Finally, because of personnel on site, the GB antenna could become a testbed for changes in the VLBA system.

2) Reliability.

Downtime should be minimized because the people needed to repair a malfunction are on site.

This fact has relevance to the uv-coverage debate for the obvious reason that a missing antenna creates holes in the uv plane.

3) Cost.

Peery's VLB Array Memo No. 610 details significant cost savings if the antenna is sited in GB. Other savings not mentioned include test equipment, tools, vehicles, supplies, etc.

If operations costs are squeezed very tightly, the VLBA antenna in GB could operate with only one pure VLBA employee, although I do not recommend this option.

4) Radio Frequency Interference.

Sizemore's memo reports rfi measurements made between 50 and 1500 MHz. The GB site is excellent by comparison with every other one. When comparing Sizemore's data with Oty's (VLB Array Memo No. 609) note that Sizemore's measurements are integrations over the full band for the complete time indicated, while Oty's are scans in frequency. Sizemore's therefore indicate how much rfi

is present in 20-30 minutes, typically, whereas Oty's indicate how much was present instantaneously. Equipment was not available to measure above 1500 MHz for the reason that no rfi (other than satellite transmissions affecting every site) has been serious enough to require such equipment.

Sizemore's measurements are perfect examples of advantages 1-3 above. Measurements were made quickly upon request with no equipment shipped or personnel hired.

GB has the enormous advantage that the NRQZ provides legal protection against future interference. Already in the short life of the VLBA, sites once thought acceptable (Puerto Rico and one on Hawaii) instantly became unacceptable.

The interference factor at low frequencies is as significant as the atmospheric water vapor factor at high frequencies.

## 5) UV Coverage

People exist in each of the following categories:

(a) An antenna in GB provides significantly poorer uv coverage than one in New England. How much poorer cannot be quantified.

(b) UV coverage with an antenna in GB is poorer than with one in New England, but (i) with modern data analysis techniques, the difference doesn't matter, or (ii) the difference is so small that advantages 1-4 more than compensate for it.

(c) The uv coverages of the two alternatives are of equal quality.

(d) UV coverage is better if an antenna is in GB than if it is in New England.

People in each category assert that the ones in the other 3 categories do not have equivalent expertise, but so far no one has confessed incompetence. I conclude that each individual will have to judge for himself which configuration is better and by how much. No committees or democratic votes will decide this issue.