Date: June 13, 2011
To: Whom it May Concern
CC: Roger Evans, Shaun Eyring
From: Marie Rodriguez, Natural Resource Coordinator
Re: Designing the Parks, RFP

The Valles Caldera Trust is excited to be participating in the Designing the Parks program and would like to provide a little background information to assist interested universities in submitting proposals for a studio on the Valles Caldera National Preserve.

Background –

The Valles Caldera National Preserve is an 89,000 acre unit of the National Forest System acquired by the Federal government in 2000. The landscape is located in north central New Mexico at the top of the Jemez Mountains. The Valles Caldera Preservation Act which allowed for the purchase of this stunning landscape also established the Valles Caldera Trust, a wholly owned government corporation challenged with "an experiment in public land management". The purposes of the act were:

(1) to authorize Federal acquisition of the Baca ranch;
(2) to protect and preserve for future generations the scientific, scenic, historic, and natural values of the Baca ranch, including rivers and ecosystems and archaeological, geological, and cultural resources;
(3) to provide opportunities for public recreation;
(4) to establish a demonstration area for an experimental management regime adapted to this unique property which incorporates elements of public and private administration in order to promote long term financial sustainability consistent with the other purposes enumerated in this subsection; and
(5) to provide for sustained yield management of Baca ranch for timber production and domesticated livestock grazing insofar as is consistent with the other purposes stated herein.

The act further established a benchmark for financial self sufficiency – 2015 – fifteen years following acquisition. The goal for achieving financial self-sufficiency is the most controversial element of this "experimental management regime". It is also the most misinterpreted; often referred to as a mandate. The actual legislation never refers to financial self sufficiency as a mandate but a goal to be aimed for where consistent with other purposes.

Another experimental element of managing the preserve is that there was not requirement to develop a specific land management plan such as the NPS General Management Plan or the USFS Forest Plan. Instead the act required the trust to develop a program to provide for comprehensive management. The trust assumed management of the preserve in 2002 and working with the President's Council for Environmental Quality (CEQ), the trust developed and published procedures for implementing the National Environmental Policy Act (NEPA) and to provide for the comprehensive management of the preserve (Valles Caldera Trust 2003). These procedures, published in 2003, allow the trust to build a

comprehensive management program over time adjusting and fine tuning various management elements based on the results of scientific monitoring.

Five years following the assumption of management (2002 – 2007) the trust itself had been established; a mixture of permanent and seasonal staff had been hired; interim programs had been established for managing resources and providing for public access for recreation, education and other purposes; baseline resource information had been collected, and long-term ecological monitoring sites had been established. What resource inventory, monitoring and evaluation showed was that the preserve, although visually stunning and pristine from a distance, was a land significantly impacted by more than a century and half of intensive extractive management. Forests and grasslands that were expected to support financially self sustaining management were actually in dire need of huge investments in ecological restoration. The historic and modern buildings had deferred maintenance needs of over a million dollars and required additional investments to meet ADA and basic health and safety needs for public use (Valles Caldera Trust 2007).

Over the next five years (2007-2012) the goal was to move from interim to comprehensive management. A modest long term grazing program was established based on goals for ecological restoration rather than financial self sufficiency. Further detailed assessments were completed and based on the existing condition of the preserve, extensive public involvement, and the enabling legislation, long-term plans were proposed for resource restoration and management (Valles Caldera Trust 2010) and public access and use (Valles Caldera Trust 2009). Planning and decision-making for both these long term plans should be complete by then end of 2011.

The current legislation includes several scenarios for long term management of the preserve. In 2015 and 2020 Congress has the opportunity to terminate or extend management of the preserve by the trust; if the trust were terminated at any of these points, management of the preserve would be turned over to the US Forest Service. In 2010 and again in 2011, legislation which would provide for the immediate transfer of the preserve to the National Park Service was introduced. This new legislation removes the goal for financial self sufficiency but supports continued implementation of current programs and plans. Further the proposed action and alternatives of the long term plans are consistent with both the current and proposed legislation – both of which place the greatest value on the protection and preservation of the preserve's resources and values for future generations.

Public Access and Use

The purpose of the proposed public access and use plan is to expand public access onto the preserve while protecting the natural and cultural resources from the potential impacts and degradation that can result from increased access. The proposed action includes the development of a portal for visitors to access the preserve. This would include a visitor center and ancillary day use amenities. The need for the proposed action was established largely through an extensive public involvement process. During public workshops and via written comments in 2007 and 2009, the public expressed a desire for more access, more spontaneous access, more freedom to explore, sustainable management practices, a modest scale of development, and protection of resources and values. It was concluded that the trust needed to:

- **Provide more access, more spontaneous access, and more freedom to explore the preserve**. Public access to the preserve is currently managed under an interim recreation program that manages visitation consistent with the existing capacity of the land and facilities. Spontaneous recreation is limited to views of the Valle Grande from pull-offs along NM-4, two trails accessed

from the highway, and short hikes and tours staged from the Valle Grande Staging Area. Activities and access to other areas of the preserve require a reservation and a fee. Based on public comments, it is apparent that this system prevents or discourages use by a substantial number of potential visitors. Hammitt and Cole (1998) note that, "recreation and regulations are inherently contradictory because freedom and spontaneity lie at the core of most wildland recreational pursuits." Although public comments were not homogenous, they did indicate a strong desire for increased, less-managed access.

- **Provide facilities and infrastructure that would be adequate to meet public safety standards as required by the Act if access were increased.** The current interim program is physically operated from a temporary visitor contact station, established in the Valle Grande to be limited in scale and purpose and length of service. This "temporary" facility has now been in place for six years, and would be inadequate to handle the demands of increased visitation if access were increased.
- **Provide adequate infrastructure to protect the natural and cultural resources of the preserve from increased access**. On public lands with large numbers of visitors, such as National and state parks, infrastructure, such as maintained roads, parking lots, and bathrooms, is used to protect resources by influencing impact patterns. Impacts are typically highly concentrated around attractions and recreational facilities, and along travel routes that connect them. Concentration of use means that pronounced impacts occur in only a small proportion of any recreational area, resulting in minimal impact throughout the vast majority of the area. This situation can be reinforced through careful infrastructure planning and design (Hammitt and Cole 1998). The preserve is currently lacking this type of infrastructure.
- **Provide a portal or physical point of access to the preserve.** There is currently no facility to provide a physical point of access to the preserve and to limit or disperse visitation consistent with the current capacity of the land and facilities. The lack of a facility is one of the reasons that the trust has used both a reservation and lottery system to provide access under the interim recreation program. This arrangement has allowed for some access and the development of unique outdoor recreational activities and educational events. However, it limits spontaneous access and general interest recreation activities on the preserve.
- **Manage the preserve in a sustainable manner.** Both the trust and the public want to manage the preserve, including its infrastructure, in a sustainable manner and minimize its carbon footprint. Because very little permanent infrastructure exists and long-term access and use plans have not been developed, the trust has a very good opportunity to plan for sustainable infrastructure and use policies. The trust needs to identify and incorporate long-term sustainability concepts in programs and facilities for public access and use. The Federal Leadership in Environmental, Energy, and Economic Performance Executive Order (No. 13514) signed Oct. 5, 2009 reinforces this need to plan government facilities to be sustainable.
- **Provide programs, activities, and facilities that promote long term financially sustainable management of the preserve, at a scale appropriate to public demand and values, and consistent with other purposes**. The Act includes a benchmark for financially self-sustaining management of the preserve. Management goals identified in the Act include optimizing the generation of income and promoting long-term financial sustainability consistent with long-term protection and preservation of resources and values, such as natural and cultural resource preservation.

Signature-based Design

The current schedule for decision-making dovetails perfectly with the schedule for the design studios. The final PAUP will include a location, general scale and capacity, and guidelines regarding design. We have proposed an ecological based design concept called signature-based design. The language in the PAUP is general providing objectives for design rather than details. Besides the Visitor Center the PAUP will guide the development of future facilities and infrastructure (trailheads, overlooks, parking/shuttle stops) none of which exist today. These design objectives have been proposed as part of all action alternatives; here is how they are presented in the proposed plan:

(Draft language) The preserve would incorporate an ecological design concept called signature-based design, which is based on relationships displayed within a particular region, such as trees responding where additional moisture is present. Such relationships characterize an area and create a sense of recognition that invokes a sense of place and resulting human attachment. They are "signatures of a place" (Woodward 1997). A region's signatures can be identified through understanding the geomorphic, climatic, biotic, and cultural processes that shape an area's landscape, which ultimately guides new designs. Human needs are also factored into these processes, including needs for protection, production, and order (Woodward 1997). Signature-based design objectives that would apply to the Valles Caldera visitor center include:

Table 1. Signature-Based Design Objectives for Valles Caldera

Design for Natural Flows	Minimize off-site water importation and run-off Minimize heating and cooling requirements Provide for wildlife movement and habitat needs Maintain soil nutrients Decrease generation of solid waste Incorporate natural remediation, such as wetlands Use products and services with minimal embodied energy
Respect Cultural Needs	Acknowledge historical, geographical, and cultural affiliations Seek input from local tribes and communities Design to reflect cultural influences
Provide Sense of Place	Provide comfort, visual, and sensory pleasure such as views and natural sounds Provide settings for interpretation and interaction Provide easy immediate access and orientation Provide access to recreational opportunities
Incorporate Financial Sustainability	Create designs that are affordable to maintain over time Identify methods of reducing construction costs

After sustainable design objectives have been defined, they can be used to define design guidelines, which identify potential options for using patterns to enhance site function, human response, and regional distinctiveness (Woodward 1997). Landscaping guidelines that would be considered include:

- Incorporate plants used as wildlife habitat to enhance wildlife corridors and nesting/breeding functions.

- Incorporate plants to support reintroduction of extirpated species. Willow, for example, would encourage recolonization by beaver.
- Incorporate plants dispersed by wildlife.
- Use plants, such as native wetland species where appropriate, to help improve water quality.
- Use plants with cultural significance and/or potential for interpretation.
- Place larger plants at greater densities on north faces to demonstrate differences between northern and southern exposures.
- Use larger plants in areas of water concentration than on slopes.
- Where water concentrates, use plants with different moisture requirements to mark slope gradient changes.
- Use plants with different soil requirements where soils change from fine to coarse grained.

Incorporation of patterns would also reflect temporal scales, considering how the site will change over time through such processes as maturation of trees and self-perpetuation of grasses and wetlands. Future anticipated changes regarding land use, water availability, and energy costs and availability would also be factored into initial design. An example includes acknowledging the cooler microclimate that would exist on the north side of the visitor center where water would evaporate less quickly. Larger, denser plants such as pine trees could be a good choice for such location, carefully placed to avoid possible damage to the structure from falling branches as the trees mature in the future. Larger plants would also be used at areas of water concentration, such as between slope and toe of slope. Wetlands would be planted at the site's low point, surrounded by less mesic species that are ringed by xeric grass species. The resulting designs would be used to "begin to tell a story about climate, soil, landform, birds, plants, and the landowner" (Woodward 1997).

The following characteristics of sustainable design would be used for selecting specific design applications for the Valles Caldera visitor center.

- Energy source: Use renewables where appropriate, such as wind, solar, biomass, or small-scale hydro.
- Materials: Include restorative materials cycles where waste from one product becomes food for another, built-in reuse, recycling, durability, ease of repair
- Pollution: Produce minimal output; waste types conform to ecosystem absorption ability.
- Toxic substances: Use very sparingly only in special circumstances
- Embodied energy: Consider ecological impacts over product life, from materials extraction to final recycling.
- Sensitivity to ecological context: Respond to bioregion; integrate with native soils, vegetation, materials, culture, climate, topography.
- Sensitivity to cultural context: Respect and incorporate traditional knowledge of place and local materials and technologies.
- Diversity: Maintain biodiversity and the locally adapted economies and cultures that support it.

- Spatial scales: Integrate design across multiple scales, respecting the influence of larger scales on smaller and vice versa.
- Whole systems: Provide greatest degree of internal integrity and coherence.
- Role of nature: Use nature's design intelligence instead of reliance on man-made materials and energy.
- Types of learning: Make nature and technology visible, highlighting sustainable systems used in the design.
- Response to sustainability needs: Incorporate designs that regenerate human and ecosystem health.

To the extent possible, the structure would connect people to the change and flow of climate, season, sun, and shadow to emphasize awareness of natural cycles. Sustainable design would incorporate natural processes and interactions into the human environment. The technology that supports human life, such as plumbing and electrical wiring, has become hidden in attempts to sanitize nature. Where possible and appropriate, designs would reacquaint visitors with nature's communities while teaching about ecological consequences of human activities (Van der Ryn and Cowan 1996).

Water conservation is also crucial to sustainable building. Typical water usage requirements that apply to this plan are presented in the following table:

Table 2: Water Usage by Facility Type

Facility	Water Use (gal/person/day)
Campground	25
Drinking fountain	3
Faucet	11
Cafeteria	20
Restaurant	7-10 gal/customer/day

Source: AWWA 2010, OSU n.d.

Water conservation strategies can reduce water use below common practice by over 30% indoors and over 50% for landscaping (Kats 2003a). Those that would apply to this plan include:

- Make more efficient use of potable water through better design and technology. The supply of potable water and the disposal of rainwater would be addressed to reduce water consumption.
- Use recycled/reclaimed water; capture and use graywater (non-fecal waste water from bathroom sinks, bathtubs, showers, etc.) for irrigation. Drawdown of aquifers would be minimized in anticipation of future changes in water availability. Rainwater harvesting is appropriate when groundwater supplies are limited or fragile, are polluted or significantly mineralized, or when stormwater runoff is a major concern (Kibert 2008). Because the preserve's groundwater may contain minerals due to the volcanic nature of the area, and summer monsoon storms could increase stormwater runoff, a rainwater harvesting system would be considered. Such a system usually includes a catchment area (typically the building's roof), roof-wash system, prestorage filtration, rainwater conveyance, cistern, water delivery pump, and water treatment area (Kibert 2008).

Optimize the site and its orientation. Passive design strategies offer the most cost effective means of heating buildings. When included in initial building design, passive solar applications add little or nothing to the cost of a building, yet result in reduced operational costs and equipment demand. It is reliable and mechanically simple (AZ Solar Center 2010).

These passive design techniques would be augmented by designing the building shape for maximum heat gain. Passive design for structures in the northern United States, with cooler temperatures such as those at Valles Caldera, is typically square in shape, which minimizes the surface area through which heat can be transmitted. East and west surfaces experience the most sun load, and south-facing walls experience variable sun load throughout the day (Kibert 2008). Given the preserve's cool temperatures, maximizing the structure for optimal heat absorption and retention would help reduce heating costs. In addition, the structure would be designed to focus heat on the bottom six feet of the building, where occupants are usually located. Doing so would also reduce building height, which in turn lowers material costs (Kibert 2008).

In addition to incorporating a passive solar system, the visitor center would also incorporate an active solar system, if possible. Active solar space-heating systems consist of collectors that collect and absorb solar radiation and use electric fans or pumps to transfer and distribute the heat. Active systems usually have an energy-storage system to provide heat when the sun is not shining (EERE 2008). Although placing solar collectors on the roof of the structure or close to it would result in visual impacts, the panels would provide an interpretive opportunity and means of making nature and technology visible.

Energy savings would be further enhanced through the use of daylighting. Daylighting uses natural light to illuminate a building, although there are trade-offs between admitting light and admitting cool air. The cost of skylights and windows also increases costs compared to traditional construction. Proper design can help alleviate costs by assessing daylighting for each area of the building, designing daylighting for specific tasks, and installing light-activated controls. Daylighting can be optimized by orienting the building on an east-west axis, painting interior surfaces bright colors, organizing electric lighting to complement daylighting, and arranging spaces to optimize use of daylighting (Kibert 2008).

In addition to optimizing energy use through daylighting and passive solar, windows would be placed to provide views of the valleys and wildlife. Spotting scopes would be placed outside along the porch or other pertinent locations.

- Design for the use of trees, which have an enormous capacity for stormwater uptake and can be used to control the amount of sunlight that falls on a building by shading it with leaves in the summer and providing more sunlight in winter after leaves have fallen. Trees would be strategically planted to contribute to stormwater uptake. If possible, vegetation would be selected to support reintroduction of extirpated species, such as the New Mexico meadow jumping mouse, which the preserve is interested in encouraging. Specific plant species would also be strategically planted to encourage nesting and breeding functions, as well as seed dispersion by wildlife, which would help improve wildlife corridors and enhance visitors' visual experience.
- Design the building to take advantage of the thermal properties of the ground and groundwater to help provide heating and cooling and lower energy consumption. A geothermal, or ground-source heat pump (GHP), would be used to heat and cool the building. Although outside temperatures vary significantly by season, the temperature of the ground a few feet below the earth's surface remains

at a relatively constant temperature, ranging from 45 to 75 degrees depending on location. Like a cave, the ground temperature is warmer than the air above during winter and cooler than the air in summer. It is therefore more efficient to heat or cool air from this constant temperature, rather than heat or cool summer or winter outdoor air.

- Use composting toilets if possible, which can filter graywater for other uses. Composting toilets are being used successfully at national park facilities, particularly Grand Canyon National Park. Although these types of systems greatly increase water conservation, more site-specific details would be required to determine their feasibility. Alternatively, low-consumption toilets and waterless urinals would be considered for reducing water usage, which would require a septic system. If a septic system is used, graywater would be required. By separating blackwater (septic) from graywater, far less blackwater would be produced, which could be treated on-site in individual septic tanks and leach fields. Soil surrounding the drainfield must be able to absorb and treat the effluent (North Carolina Cooperative Extension Service 1996). A septic system would require a large leach field with monthly maintenance and occasional addition of chemicals.
- Design for the use of existing or constructed wetlands for wastewater treatment and stormwater storage, reducing capital costs. Parking areas would be sized appropriately and designed with porous materials to reduce contaminated runoff. Run-off from paved roads and parking areas would be directed to islands in the parking area or natural low areas, where stormwater runoff would be collected and treated with a constructed wetlands filtration system and directed into toilets if composting toilets are not used. Wetlands would be planted at the site's low points, surrounded by less mesic species, which would be ringed by xeric grass species. Such an arrangement would also demonstrate different soil requirements and slope gradient changes, and "begin to tell a story" about the area that can be used interpretively to demonstrate nature and technology working together (Woodward 1997).
- Reduce project size: Space-efficient design would be used; certain spaces would be moved to the building exterior if possible. Systems that heat and cool only the bottom 6 feet of vertical zones, where occupants usually are located, would be considered to reduce overall building heights and lower material costs.
- Eliminate unnecessary finishes and features: Features such as dropped ceilings would be eliminated to allow more daylight penetration and reduce overall building dimensions. Unnecessary finishes and features would also be avoided to create a more natural environment.
- Decrease site infrastructure: The site would be carefully planned to minimize disturbance by using natural drainage rather than storm sewers, minimizing impervious surfaces, reducing the size of roads and parking lots, using natural landscaping, and reducing other man-made infrastructure where possible.

The visitor center and/or contact station would function interpretively as a model for sustainable design, offering an educational opportunity to visitors. Preserve staff could conduct tours of the facility, explaining how the Trombe wall generates heat and how the wetlands clean wastewater. A "Sustainable Design Day" could be offered that expands on this idea, with contractors and suppliers available to offer more detailed explanation about how these systems work, what the payoffs are, and how to incorporate them into other settings.

Additional Sources of Information

Additional background information on the history of the preserve and its management can be found on our website, www.vallescaldera.gov. The following publications may be of particular interest:

More than a Scenic Mountain Landscape: The Valles Caldera National Preserve Land-use History
http://www.vallescaldera.gov/about/trust/docs/trust_LandUse-History.pdf

Valles Caldera National Preserve: Master Plan for Interpretation
http://www.vallescaldera.gov/about/trust/docs/mpi/mpi.pdf

Valles Caldera National Preserve: Framework and Strategic Guidance for Comprehensive Management
http://www.vallescaldera.gov/about/trust/docs/cmf/Framework.pdf

Public Access and Use: Various Documents
http://www.vallescaldera.gov/nepa/pages/content.aspx?id=2416dcaf-a923-47fa-b76d-2c6b4fdc41bf&altID=4

Valles Caldera Preservation Act: http://www.vallescaldera.gov/about/trust/docs/PL%20106-248.pdf

Statement of the Valles Caldera Board of Trustees Chair, Dr. Raymond Loretto, in support of the transfer of management of the preserve to the NPS:
http://www.vallescaldera.gov/newsmedia/news/news_S564_TRUST_OMB_cleared.pdf

Reports to Congress (2004-2010): http://www.vallescaldera.gov/about/trust/trust_refreport.aspx

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Works Cited

Valles Caldera Trust. "National Environmental Policy Act Procedures of the Valles Caldera Trust for the Valles Caldera National Preserve." *Federal Register / Vol. 68, No. 137 .* Washington D. C.: Government Printing Office, July 17, 2003.

—. "Notice of Intent to Prepare an Environmental Impact Statement for a Landscape Resotration and Management Plan." *Federal Register /Vol. 75, No.136.* Washington D.C.: Government Printing Office, July 16, 2010.

—. "Notice of Intent to Prepare and Environmental Impact Statement for a Public access and Use Plan." *Federal Register, Vol. 74, No. 166.* Washington D.C.: Government Printing Office, August 26, 2009.

Valles Caldera Trust. "State of the Preserve." Cumulative Effects Analysis, Jemez Springs, 2007.