

December 15, 2011

MEMORANDUM TO: Ryan Whited, Chief  
Environmental Technical Support Branch  
Division of Site and Environmental Assessment  
Office of New Reactors

FROM: Michael T. Masnik, Team Leader **/RA/**  
Water and ecology Team  
Environmental Technical Support Branch  
Division of Site and Environmental Assessment  
Office of New Reactors

SUBJECT: TRIP REPORT – OCTOBER 2-6, 2011, PRE-APPLICATION  
READINESS ASSESSMENT (C-1) VISIT FOR AN EARLY SITE  
PERMIT AT THE BLUE CASTLE PROJECT SITE

This report summarizes the staff's October 2 - 6, 2011, pre-application readiness assessment (C-1) visit related to the environmental portion of a future early site permit (ESP) application by Blue Castle Holdings, Inc. for a two-unit nuclear plant at a site near the town of Green River in east-central Utah. The facility is referred to as the Blue Castle Project. Blue Castle Holdings, Inc. has not selected a reactor design for the proposed new nuclear station and it plans to consider the plant parameter envelope approach for its ESP application.

The purpose of this visit was to acquaint the environmental review staff with the nuclear station site, focusing on the Blue Castle Project site and the associated facilities and areas likely to be affected during construction and operation. The staff also assessed the applicant's readiness and its progress toward submitting an ESP application. The site is located near Green River, Emery County, Utah, approximately 5 miles west-northwest of Green River and 150 miles south south-east of Salt Lake City, Utah. The staff visited the regional offices of the U.S. Geological Survey and the U.S. Fish and Wildlife Service, and the Utah Department of Natural Resources; the governmental interactions were conducted in the vicinity of Salt Lake City, Utah. Enclosure 1 provides a list of attendees at the Blue Castle Project site visit on October 4<sup>th</sup>. Enclosure 2 is the agenda prepared for the site visit. Enclosure 3 is a summary of the more significant issues that were discussed during the visit. Enclosure 4 is a list of attendees at the meeting with the U.S. Geological Survey, held on October 3, 2011. Enclosure 5 is a list of attendees at the October 3<sup>rd</sup> meeting with the Utah Department of Natural Resources. Enclosure 6 is a list of attendees at the October 6<sup>th</sup> meeting with the U.S. Fish and Wildlife Service.

CONTACT: Michael T. Masnik, NRO/DSEA/RENV/RWET  
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On October 4<sup>th</sup> the staff participated in a general discussion of the prospective applicant's plans followed by a site tour that included planned offsite facilities. The purpose of the tour was to understand the site-specific issues and concerns related with this proposed action. The tour covered the proposed location of the Blue Castle Project, location of the meteorological measurement system, and the proposed station cooling water intake location.

In summary, the staff did not identify an issue that would indicate that Blue Castle Holdings, Inc. would not be ready by the planned date of application. However, this was not a formal or comprehensive staff review and additional issues could be identified during the staff's formal review after the application is submitted. The project is at an early stage and much of the data collection is still underway.

The staff has no specific schedule for additional environmental pre-application related activities at this time.

Project No.: 0768

Enclosures: As stated.

cc: Thomas P. Retson, COO  
Blue Castle Holdings, Inc.  
86 North University Avenue, Suite 400  
Provo, Utah 84601

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DATE	12/ 7 /11	12/ 8 /11	12/15/11

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**List of Attendees – Blue Castle Project C-1 Readiness Assessment Visit**

Location: Blue Castle Project Site, Green River, Utah  
October 4, 2011

<b>Name</b>	<b>Affiliation</b>
Michael T. Masnik	U.S. Nuclear Regulatory Commission (NRC)
Barry Zalcman	NRC
Michael Eudy	NRC
Joseph Giacinto	NRC
Randall Lantz	Enercon
Fred Redwanz	Enercon
Reed Searle	Blue Castle Holdings, Inc.
Guy Cesare	Enercon
Anubhav Gaur	Enercon
Jeff Laughlin	Enercon
Stacy Burgess	Enercon
Rachel Turney-Work	Enercon
Melinda Harris	Enercon
Joe Mancinelli	Enercon
Tom Retson	Blue Castle Holdings Inc.
Cary Balber	Enercon
Bob Evens	Enercon
Aaron Tilton	Blue Castle Holdings, Inc.

**Blue Castle Project C-1 Environmental Review Meeting Agenda  
October 4 – 6, 2011**

**Sunday, October 2, 2011**

Travel day for team members traveling to Salt Lake City, UT

**Monday, October 3, 2011**

0930 hrs Meet with representatives of the U.S. Geological Survey

1400 hrs Meet with representatives of the Utah Department of Natural Resources

1600 hrs Team travels to Green River, UT

2000 hrs Brief team meeting in lobby Holiday Inn Express to discuss the following day's activities.

**Tuesday, October 4, 2011**

0830 hrs Introductory meeting, presentation on applicant's vision and plans, region and site layout (aerials), and address general questions about application

1330 hrs Site and Green River orientation/site visit

1500 hrs Technical area breakout sessions

1700 hrs NRC staff debriefing; discussion of: 1) what was accomplished in breakout sessions; 2) status of discussion topics; 3) issues or concerns

1730 hrs Meeting with applicant and outbrief

**Wednesday, October 5, 2011**

0830 hrs Additional site orientation activities by NRC personnel. Reconnaissance of Green River, nearby transmission system, and cultural resources

1400 hrs Travel to Salt Lake city, UT

**Thursday, October 6, 2011**

0900 hrs Meeting with representatives of the U.S. Fish and Wildlife Service

**Additional Information Summarizing the Blue Castle Project  
Readiness Assessment Visit (C-1)  
Location: Green River, Utah  
October 4 – 5, 2011**

Overall, Blue Castle Holdings, Inc. (BCH) appears to be on course for gathering the needed data that will allow it to submit an environmental report (ER) in support of an early site permit (ESP) application. During the site visit, several issues were identified that warrant attention by BCH. The following sections, listed by discipline, describe the results of the U.S. Nuclear Regulatory Commission (NRC) staff visit. The prospective applicant indicated that it planned to use a plant parameter envelope (PPE) approach for its ESP application that would be an ensemble of values for the PPEs based on light water reactor (LWR) designs that are certified. The applicant is proceeding with its site suitability analysis (principally with regard to site safety aspects), which may cross cut with environmental issues.

**Alternatives**

The NRC staff asked for an overview of the site selection process used to identify the Blue Castle Project site as the proposed site. There was considerable discussion on the screening process. The staff suggested that additional explanation of the screening criteria and how they were employed to identify the proposed site and the slate of alternative sites would be needed for the ESP review. The methodology for site selection was based on the approach outlined in the Siting Guide: Site Selection and Evaluation Criteria for an Early Site Permit Application; Electric Power Research Institute (EPRI); No. 1996878; March 2002. The guide allows for weighting factors to be applied to the individual criteria on a project-specific basis.

The potential applicant also needs to address alternative cooling systems in the application. In light of the arid nature of the site and environs, the scarcity of surface waters, and the consumptive nature of the proposed cooling system the staff expects that a number of alternative cooling systems will be discussed.

As allowed by Title 10 of the Code of Federal regulations (10 CFR) 51.50(b)(2), an ESP applicant need not consider the alternative energy technologies. The applicant did not indicate that it plans to address this issue.

**Land Use**

The site, located in Emery County, near Green River, Utah, is made up of several land parcels totaling about 1700 acres. The applicant is considering some land exchanges to consolidate its holdings, but its areal extent is already likely to be of sufficient size to host the project. The site is considered to be a "greenfield" site in that it has not been developed for industrial use previously; the site is zoned for industrial use. It has ready access to rail and transmission lines with relatively short distances to interconnect to existing rights of ways. Interstate-70 is proximate to the site area as well. A more detailed site description will be included in the ER.

**Meteorology and Air Quality**

The meteorological measurement system was recently installed on the proposed Blue Castle Project site and the data collection program was initiated. The applicant indicated that the equipment specifications conform to guidance in the latest version of Regulatory Guide 1.23.

The system is located in an unobstructed area (accounting for structures and major land features) and on a surface that is characteristic of the surrounding terrain. An assessment of the quality measures and the data is deferred until subsequent readiness assessments when sufficient data is collected for comparison with other data sources in the region.

There are few major industries in the Blue Castle Project site area that can contribute to emissions in the air shed. Nevertheless, air quality may be an important institutional factor for power development projects in the State of Utah; nuclear power is considered to be a qualifying “zero” carbon emissions source in Utah.

### **Hydrology**

Blue Castle Holdings, Inc. identified the Green River as the potential source of cooling water makeup for the proposed two units. Surface water for plant cooling would be withdrawn from a conventional intake structure located on the west bank of the Green River just upstream of the US Route 70 bridge. Water withdrawn from the river would be conveyed to the site by pipeline. Cooling water would be reused until the total dissolved solids concentration in the circulating water would become unacceptable. Blowdown from the circulating cooling water with high total dissolved solids would then be piped to an onsite closed evaporation basin. There would be no discharge of blowdown to the Green River. Additional discussion and analysis to demonstrate an adequate supply of surface water would be needed for the ESP application. The discussion would also need to address the need for supplemental onsite reservoir for water storage. A description of structures and systems to improve water quality (specifically total suspended solids) of water withdrawn from the Green River needs to be provided. The staff understands that the intake structure will meet the EPA Phase I national standard for through screen intake velocity of a maximum of 0.5 feet per second. However, in discussions with the US Fish and Wildlife Service (USFWS) representatives the service plans to require a maximum through screen velocity of 0.33 feet per second to protect the young of the Colorado pike minnow (*Ptychocheilus lucius*), a Federally protected species.

The potential applicant has no plans to use groundwater for any plant systems, nor do they plan any operational discharges to groundwater.

### **Terrestrial Ecology**

Due to the arid nature of the site and environs there are very limited terrestrial resources. The applicant has conducted and will conduct terrestrial surveys of the site. It is unlikely that the site has any Federally protected species that could be affected by plant construction and operation. There are very limited wetlands resources located near the Green River that may be affected.

### **Aquatic Ecology**

The only aquatic resource in the vicinity of the plant site is the Green River. There are no permanent onsite water bodies. Limited sampling of aquatic resources in the Green River near the site and proposed intake location has been completed, additional sampling is planned. Based on fish sampling to date in the Green River near the site, the fishery appears to be diverse and relatively abundant. Federally protected species are found in the vicinity of the proposed intake including the Colorado pike minnow. Consultation under the Endangered Species Act will be required. Preliminary discussions with the US FWS has revealed concerns related to the fishery over surface water availability, design and through screen velocities of the

proposed shoreline intake structure (see the hydrology section above) and the presence of important fish habitat near the proposed intake location.

### **Socioeconomics/Environmental Justice**

The BCH contractor is beginning to assemble the more detailed socioeconomic and demographic information for the Green River area needed for inclusion in the applicant's ER. The Green River area has historically experienced cycles of up- and down-turns related to long-term projects in the region. The applicant is aware that the remoteness of the site area from major urban centers and the size of the workforce (construction and operation periods) could have an effect on services and other socioeconomic factors that would need to be discussed in its ER. The region has been populated by Native Americans; these and other special populations would need to be considered in the applicant's environmental justice assessments.

### **Cultural Resources**

The Green River region is culturally rich dating back to prehistoric times. There are a number of land features that were important ceremonial sites for Native Americans and some sites are adorned with petroglyphs of importance in the region. The presence of a fresh water source and the ability to ford the river in the Green River area are likely significant factors in the history of the region. The region has also been the staging and departure area for a number of expeditions led by Maj. John Wesley Powell on the Green and Colorado Rivers; in fact, Green River hosts the John Wesley Powell River History Museum. The site area that would likely be disturbed to develop the project may not have significant cultural resources that could be affected. The direct effects of the project and the effects of the project on the viewshed should be considered in greater detail later in the readiness assessment process.

### **Radiological Evaluations**

Radiological environmental monitoring program plans were not considered at this early stage of pre-application readiness assessment.

Inasmuch as the applicant plans to consider certified LWR technologies, for fuel cycle issues, the approach included in Title 10 of the Code of Federal Regulations (10 CFR) 51.51(a), Table S-3 should be considered.

### **Accident Analyses**

The design basis and severe accident analyses were not considered at this early stage of the pre-application readiness assessment.

Inasmuch as the applicant plans to consider certified LWR technologies, a number of matters would be generically resolved by consideration of site parameters. The applicant would need to demonstrate that the site characteristics unique to the Blue Castle site are bounded by the site parameters considered in the design certification review.

**Need for Power**

As allowed by 10 CFR 51.50(b)(2), an ESP applicant need not consider the benefits assessment, which includes the need for power assessment. The applicant did not indicate that it plans to address this issue.

**Assessment of Readiness**

The team found that BCH and its contractors appreciate the NRC's requirements for submitting an ER in support of its ESP application. The BCH team that is being assembled has prior experience in preparing ERs and is aware of the NRC's process for conducting its environmental reviews, including audits and requests for additional information. However, BCH has a significant amount of work to complete before it can submit an ER. The traditional C-1 Stage would have involved a larger complement of technical specialists to step through each resource areas that have been explored in detail, but it was apparent that the applicant was at the early stages of data collection and analysis. The applicant is making good progress and this early interaction to articulate NRC expectations for a high quality, thorough, and complete application would benefit the preparation of the ESP application. Given the schedule that is envisioned for the application, we recommend that this project be placed on the "Optimal" pre-application course (which allows for such early interactions), closer to 20-months prior to application, rather than the "Compressed" pre-application course, or 12-months prior to application. The additional time and the additional step (i.e., considering this interaction to be an O-1 rather than a C-1) would allow for an additional interaction with subject matter experts in key resource areas after the applicant has fully developed its assessments.

**List of Attendees – Blue Castle Project C-1 Readiness Assessment Visit  
Meeting with the U.S. Geological Survey**

Location: West Valley City, Utah  
October 3, 2011

<b>Name</b>	<b>Affiliation</b>
Michael T. Masnik	U.S. Nuclear Regulatory Commission (NRC)
Joseph Giacinto	NRC
Terry Kenney	U.S. Geological Survey (USGS)
David Susong	USGS
Cory Angeroth	USGS
Vic Heilweil	USGS

**List of Attendees – Blue Castle Project C-1 Readiness Assessment Visit  
Meeting with the Utah Department of Natural Resources**

Location: Salt Lake City, Utah  
October 3, 2011

<b>Name</b>	<b>Affiliation</b>
Michael T. Masnik	U.S. Nuclear Regulatory Commission (NRC)
Joseph Giacinto	NRC
Reed Harris	Utah Department of Natural Resources (UDNR)
Dennis Strong	UDNR
Eric Millis	UDNR
Kent Jones	UDNR

**List of Attendees – Blue Castle Project C-1 Readiness Assessment Visit  
Meeting with the U.S. Fish and Wildlife Service**

Location: West Valley City, Utah  
October 6, 2011

<b>Name</b>	<b>Affiliation</b>
Michael T. Masnik	U.S. Nuclear Regulatory Commission (NRC)
Kevin McAbee	U.S. Fish and Wildlife Service (FWS)
Jaena Mohrman	FWS