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December 16, 2019

John Tappert, Director
Division of Rulemaking, Environmental and Financial Support
U.S. Nuclear Regulatory Commission
Mail Stop T4-B72
11545 Rockville Pike
Rockville, MD 20852

Dear Director Tappert,

The New Mexico Environment Department (NMED) provides its comments regarding the U.S. Nuclear Regulatory Commission's (NRC) working draft of the Draft Environmental Impact Statement (EIS) for the proposed Holtec Consolidated Interim Storage Facility for spent nuclear fuel. NMED provides these comments pursuant to a Memorandum of Understanding (MOU) between the department and the NRC signed July 24, 2019, which recognizes the state's expertise regarding the regional environmental impacts and environmental permitting aspects of the proposed project. Our comments reflect NMED's technical expertise in groundwater and surface water, including geology and other industrial activity around the specific proposed Holtec site.

Based on NMED's review of Holtec's application and relevant sections of the working draft EIS, we identified concerns that must be addressed in the Draft EIS that NRC publishes for public review. Key shortcomings of the current draft EIS include groundwater characterization, analysis of pathways from the site to groundwater, protection of surface waters of the state, applicability of relevant New Mexico standards for groundwater and surface water, and long-term monitoring of environmental impacts from the site. It is imperative that the Draft EIS fully and accurately address these issues, as they are laid out in our comments.

Thank you for the opportunity to enter into the MOU as a cooperating agency and to participate in NRC's development of the EIS. Please let me know when the official Draft EIS for this project is sent to the Federal Register for publication. You can reach me at Rebecca.roose@state.nm.us or (505) 827-1758.

Sincerely,

Rebecca Roose, Director
Water Protection Division

Attachment – NMED comments

cc: (via email)
James C. Kenney, Cabinet Secretary, NMED
Courtney Kerster, Director of Federal Affairs, Office of Governor Michelle Lujan Grisham
Jennifer Hower, General Counsel, NMED
Michelle Hunter, Chief, Ground Water Quality Bureau, NMED
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Jill Caverly, Senior Project Manager, US NRC
Stacey Imboden, Senior Project Manager, US NRC

developed by NMED permit staff, subject to public review and request for hearing and appealable to the New Mexico Water Quality Control Commission. See comment 7.1 below for more discussion of groundwater discharge permit process.

1.5 The DEIS is inconsistent regarding the hydrologic relationship between the playas (Laguna Plata and Laguna Gatuna) and the area's shallow groundwater. "*Evaporation is the only mechanism for water loss in Laguna Plata and Laguna Gatuna ....*" Section 5.5.1 (Surface Water). The DEIS further states, "*[m]ost of the shallow groundwater in the immediate vicinity of the proposed CISF project area has been directly or indirectly affected by brine discharges from potash refining or oil and gas production into local playas ....*" Section 3.5.4.2 (Local Groundwater Quality). The DEIS must account for the fact that the playas are capable of impacting groundwater because all stormwater runoff from the HI-STORM UMAX ISFSI Pads is proposed to be directed to Laguna Plata.

1.6 The DEIS insufficiently describes the consequences of a significant storm event to the playas. "*Based on a flooding analysis for full build-out (Phases 1-20), [*the Applicant*] stated that both Laguna Plata and Laguna Gatuna would be able to accept runoff from a 24-hour/19 cm [7.5 in] storm event with excess freeboard....*" 4.5.1 (Surface Water Impacts). "*Surface water runoff from the approximately ... [330 ac] footprint of the facility would be able to be fully captured by Laguna Plata and Laguna Gatuna, assuming that both lagunas were dry prior to the start of the rain event ....*" Section 5.5.1 (Surface Water). Understanding that Laguna Plata is the recipient of all impacted stormwater and possibly all facility wash-water and indoor spills, NMED suggests any water overtopping the playas would infiltrate the nearby Quaternary alluvium and significantly affect shallow groundwater. The DEIS needs to thoroughly address the possibility of the overtopping of the playas.

1.7 The DEIS insufficiently and inconsistently addresses the existence and implications of groundwater accumulating in the Cenozoic alluvium above the Dockum claystones. The limit of the Applicant's investigation of the zone is expressed in the Application. "*Two wells, ELEA-1 and ELEA-2 were drilled on the Site to identify the depth and character of water-bearing rocks. The goals of the drilling investigation were to identify the potential for thin groundwater saturation in lower alluvium perched on the Triassic shale ....*" Application Section 3.5.2 (Groundwater). "*Based upon information obtained from the onsite drilling, shallow alluvium is likely non-water bearing at the Site.*" Application Section 3.5.2 (Groundwater). DEIS statements suggest that shallow water does exist in the zone. "*Springs in the vicinity of Laguna Gatuna and Laguna Plata suggest the existence of shallow groundwater ....*" Section 4.5.2 (Groundwater Impacts). "*Due to the semiarid climate, recharge by infiltration from precipitation is significant only during intense rainfall events (storms) of long duration or frequent occurrence .... Recharge may also occur by flow from adjacent formations.... The saturated thickness of the Cenozoic alluvium of the Laguna Valley area ranges from ... [15 to 30 ft], and water levels are about ... [30 ft] below the land surface.*" Section 3.5.2.1 (Regional Groundwater Resources). A full understanding of this zone of groundwater accumulation is important to understanding the environmental impact of the CISF. The Cenozoic alluvium above the Dockum clays is used at numerous waste management facilities in southeast New Mexico to monitor contaminant releases. The accumulation of groundwater in this zone could also adversely impact the CISF system. The DEIS needs to elaborate on the effects of the fractured rock in the substrate as referenced in the Application to influence groundwater accumulation. The DEIS must be altered to consistently reference this alluvial material as "Cenozoic alluvium" or "Quaternary alluvium."

1.8 The DEIS relies on an insufficient number of boreholes and monitoring wells to characterize the lithology, hydrology, and groundwater characteristics below the CISF. *"Well drilling was conducted at the proposed CISF project area in 2007 and 2017 to identify and characterize groundwater in the alluvium perched on the Dockum Group and deeper groundwater in the Chinle Formation and Santa Rosa Formation ...."* Section 3.5.2.2 (Local Groundwater Resources). Section 3.5.2.2 discusses the five exploratory boreholes/monitoring wells beneath the proposed CISF area, only one of which was drilled/constructed to evaluate the occurrence of groundwater in the alluvium, i.e., ELEA-1. Figure 3.4-7 (Hydrogeologic Cross-Section) suggests a laterally continuous "shallow groundwater potentiometric surface" below the site that occurs near the alluvium/Dockum contact, a depiction inconsistent with the results of monitor well results described elsewhere in the DEIS. The Application proposes to perform a subsurface drilling and characterization program to establish baseline concentrations of numerous non-radiological constituents in three shallow aquifers utilizing information from 29 borings. *"[The Applicant] will perform a baseline groundwater monitoring, sampling and testing program prior to construction of the CISF. Detail of the program are provided in Appendix J. Baseline groundwater monitoring, sampling, and testing will be integral to interpretation of groundwater monitoring results during construction, operation, and decommissioning of the facility by comparing future groundwater data to the baseline sampling results to demonstrate the absence or level of impacts at the site."* Application Section 4.5.1 (Construction Impacts (Phase 1)). This characterization program will greatly increase the understanding of the character and presence of groundwater below the CISF and must be completed prior to finalization of the Environmental Impact Statement and the results incorporated into the EIS.

1.9 The DEIS insufficiently addresses the need to mitigate or cease continued contamination of groundwater. *"The Cenozoic alluvium is a major source of groundwater for domestic water supplies, irrigation, industry, and livestock in southeastern New Mexico. In southern Eddy and Lea counties, the Cenozoic alluvium is a principal domestic aquifer ...."* Section 3.5.3.1 (Regional Groundwater Use). *"Much of the shallow groundwater near the Site has been directly or indirectly influenced by brine discharges from potash refining or oil and gas production. Potash mines have discharged thousands of acre-feet of near-saturated refinery process brine to Laguna Plata ... for many years. But discharges ceased in Laguna Plata in the mid-1980s... Laguna Gatuna was the site of multiple facilities for collection and discharge of brines that were co-produced from oil and gas wells in the entire area; facility permits authorized discharge of almost one million barrels of oilfield brine per month between 1969 and 1992. As a result, saturations of shallow groundwater brine have been created in a number of areas associated with the playa lakes ...."* Application Section 3.5.2.2 (Regional Groundwater). *"Laguna Plata was used for the commercial sale of salt which was mined from the surface of the laguna using belly scrapers, front end loaders, and haul trucks."* Application Section 3.5.1.1 (Lagunas).

"Impacts on groundwater resources from ... potential contamination due to improperly plugged or cased wells which could impact groundwater quality through infiltration to near-surface aquifers." Section 5.5.2 (Groundwater). *"Sinkholes and karst fissures formed in gypsum bedrock are common features of the lower Pecos region of west Texas and southeastern New Mexico. New sinkholes form almost annually, often associated with upward artesian flow of groundwater from regional karstic aquifers that underline evaporitic rocks at the surface .... A number of these sinkholes are of anthropogenic (man-made) origin and are associated with improperly cased abandoned oil and water wells, or with solution mining of salt beds in the shallow subsurface ...."* Section 3.4.5 (Subsidence and Sinkholes). *"Within the*

proposed CISF project area, there is an operating gas well and 18 plugged and abandoned wells." Section 5.5.1 (Surface Water).

The DEIS must acknowledge that the brackish nature of the shallow groundwater can only be attributed to anthropogenic sources, e.g., oil field produced water placed into the playas, improperly plugged oil wells creating a conduit for cross aquifer transport, and potash wastewaters. There is no near surface source of the quantity of salts that can explain the shallow brackish groundwater. The DEIS must further address the need to mitigate or cease continued contamination of groundwater. The DEIS fails to address the Applicant's statutory and regulatory obligation to remediate groundwater contamination at the site.

1.10 As noted in 1.2 above, the DEIS insufficiently addresses surface water infiltration to the subsurface as stormwater transports from the CISF to the playas. "*The Santa Rosa Sandstone in Eddy and Lea Counties is recharged by precipitation on sand dunes that overlie the aquifer, precipitation and runoff directly on the outcrop, and migration of groundwater from the overlying Ogallala Formation and Cenozoic alluvium ....*" Section 3.5.2.1 (Regional Groundwater Resources). "*The Cenozoic alluvium is recharged generally by infiltration of surface water from surrounding uplands and along channels of ephemeral streams ....*" Section 3.5.2.1 (Regional Groundwater Resources). "*Due to the semiarid climate, recharge by infiltration from precipitation is significant only during intense rainfall events (storms) of long duration or frequent occurrence .... Recharge may also occur by flow from adjacent formations.... The saturated thickness of the Cenozoic alluvium of the Laguna Valley area ranges from ... [15 to 30 ft], and water levels are about ... [30 ft] below the land surface.*" Section 3.5.2.1 (Regional Groundwater Resources).

1.11 The DEIS insufficiently acknowledges and challenges the Applicant's assertion that shallow groundwater below the CISF can be under artesian pressure. "*Water level in [Piezometer ELEA-2] rose slowly over several days to a static depth of 34 feet below land surface .... The water-bearing zone in this well consists of either fractures or tight sandy zones between the depths of 85 and 100 feet; water in this zone is under artesian head of 50 feet.*" Application Section 3.5.2 (Groundwater).

1.12 The DEIS fails to acknowledge the necessity of establishing background constituent concentrations for the multiple aquifers below the CISF. NMED GWQB permitting programs consider "background" the constituent concentration in groundwater before anthropogenic influence and naturally occurring from undisturbed geologic sources, versus "baseline" constituent concentrations that are in groundwater before construction of the facility. See NMAC 20.6.2.7B(1). "*[M]ost of the shallow groundwater in the immediate vicinity of the proposed CISF project area has been directly or indirectly affected by brine discharges from potash refining or oil and gas production into local playas ....*" Section 3.5.4.2 (Local Groundwater Quality). That these groundwater zones were unaffected or less affected at one time is illustrated in the following. "*The Santa Rosa Sandstone and other undifferentiated sandstones of the Triassic Dockum Group are the chief sources of groundwater in the eastern part of Eddy County .... The quality of water is generally sufficient for stock and domestic use .... The Santa Rosa Sandstone is the principal aquifer in the southwestern part of Lea County.*" Section 3.5.3.1 (Regional Groundwater Use). "*The Cenozoic alluvium is a major source of groundwater for domestic water supplies, irrigation, industry, and livestock in southeastern New Mexico. In southern Eddy and Lea counties, the Cenozoic alluvium is a principal domestic aquifer ....*" Section 3.5.3.1 (Regional Groundwater Use). In addition to addressing background constituent concentrations in the aquifers, the

DEIS needs to also address the Applicant's statutory and regulatory obligation to remediate future groundwater contamination at the site, for which background constituent concentrations would be a consideration.

1.13 The DEIS is deficient by not considering the environmental benefits of the groundwater protection structures proposed at Waste Control Specialists' (WCS) CISF. At a minimum, the DEIS must consider the WCS proposal to capture stormwater runoff from the CISF surface pad in a lined surface impoundment. The DEIS needs to consider a similar capture system for all possible adverse impacts from spills, leaks, and catastrophic releases occurring anywhere at the Holtec CISF.

1.14 The DEIS insufficiently addresses long-term monitoring of environmental impacts of the CISF, particularly in relation to non-radiological impacts, including NRC's role in long-term monitoring. This is apparent by the DEIS' lack of reference to the Baseline Groundwater Sampling Plan (BGSP in Appendix J) proposed in the Application's Environmental Report. It is unclear whether lack of reference to the BGSP, a program to identify shallow groundwater and the existing chemical composition of that groundwater, is an oversight or whether the NRC considers it unnecessary to reference the BGSP.

1.15 The DEIS fails to address the extent of fractured bedrock below the facility. There is a significant possibility that fractured bedrock exists below the proposed CFSI project area. See the Final Boring Logs included in the HI-STORE CISF Phase 1 Site Characterization by GEI Consultants (2017). At a minimum, the DEIS needs to address the associated impact to groundwater, e.g., migration mechanisms both laterally and vertically. "*Water level in [Piezometer ELEA-2] rose slowly over several days to a static depth of 34 feet below land surface .... The water-bearing zone in this well consists of either fractures or tight sandy zones between the depths of 85 and 100 feet; water in this zone is under artesian head of 50 feet.*" Application Section 3.5.2 (Groundwater).

2.0 GEOLOGY

2.1 The DEIS insufficiently characterizes the near-surface Quaternary alluvial deposits, upon and within which the proposed CISF project will be constructed and where any initial subsurface environmental degradation would occur. The DEIS states, "*[t]he entire Site is underlain by Triassic bedrock consisting of shale, siltstone, and minor, fine grained, poorly sorted sandstone. Most of the proposed operational area is relatively flat and the shale bedrock is covered by a laterally extensive veneer of 25 feet of Quaternary pediment deposits consisting of well sorted eolian sand and sandy-gravelly materials near the bedrock interface.*" Application Section 3.3.1.1 (Structural Features). The thickness of alluvial material sitewide and the existence of groundwater within the alluvium, both laterally and temporally, is insufficiently described in the DEIS. As stated earlier, this information is critical for establishing a thorough and appropriate groundwater monitoring and protection program. Furthermore, there is a possibility that the base of the HI-STORM UMAX Storage System would be situated in saturated alluvial materials. NMED considers the insufficient characterization of the alluvium to be principally due to the limited number of boreholes and the limited lithologic and geotechnical characterization at the site.

2.2 The DEIS insufficiently characterizes the Chinle Formation situated within the upper portion of the Dockum Group and the probable importance of the Formation in monitoring the environmental impact of the CISF. The DEIS provides this description, "[*t]he Chinle Formation is encountered at depths from ... [27.5 to 40.5 ft] and consists of poorly indurated mudstone with interbedded lenses of*

moderately to well indurated siltstones and conglomerate .... Results of eight in-situ permeability tests performed in the Chinle Formation ranged from 3.2 × 10^{-7} to 7.7 × 10^{-6} cm/s ..., indicating very low permeability material ...." Section 3.4.2 (Site Geology). The top surface of the Chinle Formation, below the porous alluvial deposits, is utilized at many southeast New Mexico waste management facilities as a geologic interface to monitor the infiltration and accumulation of possibly contaminated surface water. Typically at these facilities, groundwater monitoring wells monitor this interface as a component of a detection monitoring system to protect deeper groundwater. It is important to understand how the top of the Chinle Formation is oriented so that there is an understanding of how accumulated water at that interface might move. It is generally understood that this interface dips two degrees to the southeast, but this need to be confirmed and addressed in the DEIS. It is also important to understand the fracture nature of this Formation.

2.3 The DEIS should elaborate on the fact that, instead of appropriate and favorable geological and hydrological conditions, the siting of the CISF "w*as selected because of the following favorable factors... private ownership of the land ..., equal distance between the cities of Hobbs and Carlsbad ..., proximity to U.S. Highway 62/180 ..., [and] availability of federal lands for expansion.*" Application Section 2.3 (Site Selection Process).

3.0 DISSOLUTION, SUBSIDENCE, KARST HYDROGEOLOGY, AND PLAYA ORIGINS

3.1 The DEIS insufficiently addresses, mischaracterizes, and is self-contradictory regarding the potential for groundwater recharge via hydrologic communication between the ground surface, ephemeral circular freshwater wetland depressions (i.e., dolines), deep and shallow subsurface geology, and perched and/or isolated groundwaters that are temporally or spatially present. As stated in the *Quaternary Alluvium* portion of the DEIS, "*[a]quifers in the Cenozoic alluvium in southeastern New Mexico are generally considered as distinct units and are usually under water-table conditions, but artesian conditions may exist locally where clay layers act as confining beds (Richey et al., 1985)*" Section 3.5.2 (*Groundwater Resources).* This statement only holds true for aquifers within geologic formations that are not and have not been subjected to deformation by karst processes (e.g., dissolution, fracturing), unlike the area within and surrounding the proposed CISF (e.g., karst valley of Nash Draw).

More modern, technically sophisticated, and site-specific studies have been done in the 30+ years following Richey et al. (1985) that describe these processes. It is well documented regionally and acknowledged in the DEIS that Eddy and Lea Counties contain a large and diverse set of examples of surface and subsurface deformation that are the result of karst processes. It must be noted that in the Lower Pecos River Valley, the Permian basin of southeastern New Mexico, and specifically in the area surrounding the proposed CISF, "karst" and "karst processes" are not limited to the presence of massive subsurface void spaces (e.g., caves of Carlsbad Caverns) or cave-related processes (e.g., sinkhole formation through cave roof collapse). Rather, perched, isolated, and discontinuous aquifers of southeastern NM – including those of and up-gradient of Nash Draw – are the result of hydrologic conduits from the surface downwards through the permeable (e.g., silty, sandy soils) and deformed shallow subsurface geology (i.e., fractured). These conduits to downward water transport (i.e., infiltration and groundwater recharge) take various forms and length-scales but are not limited to small-scale semi-vertical dissolution pathways, sinkholes, dolines, and vertically oriented fractures in bedded geologic formations or playa bottoms. NMED has reviewed the geology, climate, and hydrogeology of southeastern NM and advises that any subsurface void space large enough to pass water molecules (i.e.,

<1 mm or greater) that is vertically connected from the surface through the vadose zone, can be a groundwater recharge pathway when water is present with sufficient pressure head to drive infiltration, such as following extreme precipitation events.

3.2 The DEIS continues, "*The Cenozoic alluvium is recharged generally by infiltration of surface water from surrounding uplands and along channels of ephemeral streams and the Pecos River. Due to the semiarid climate, recharge by infiltration from precipitation is significant only during intense rainfall events (storms) of long duration or frequent occurrence (Richey et al., 1985). Recharge may also occur by flow from adjacent formations. Near Carlsbad, the alluvium is partially recharged by flow from underlying Permian artesian limestone aquifers (Richey et al., 1985). Along the southwestern edge of the High Plains in southern Lea County, water leaves the Ogallala Formation of the High Plains and enters the Cenozoic alluvium, which underlies the Laguna Valley area (Nicholson and Clebsch, 1961).*" As noted previously, more recent, technologically advanced, and site-specific studies have elaborated on and improved NMED's understanding of the hydrologic systems surrounding the Pecos River and near the proposed CISF, all of which are absent from, or insufficiently addressed by, the descriptions in the ELEA siting study (2017), the Environmental Report (2019), and in the DEIS (see Section 8.0 References, #1-33). The DEIS also states, "*in the vicinity of the proposed CISF project area... groundwater flow direction (is) to the southwest.*"

Various protectable groundwaters exist in Nash Draw, which is directly to the southwest along the acknowledged groundwater flow direction. It is generally accepted that the Querecho Plains and Laguna Valley areas of Eddy and Lea County are the infiltration zones that recharge the protectable groundwater that flows in to Nash Draw (see Section 8.0 References, #7-11).

3.3 Surface water and groundwater resources have been affected by previous land uses at Laguna Gatuna through non-freshwater discharges to the playas which infiltrated playa bottoms, recharged groundwater, and impacted groundwater quality, as previously referenced. The DEIS acknowledges detrimental past land use impacts to the environment, "*historically, Laguna Gatuna has received brine disposal from several adjacent oil pumping operations but did not receive direct potash waste disposal. According to Lang and Rogers (2002), "[t]hese practices have dramatically altered the hydrologic condition, water quality, and ecological balance of numerous playas as suitable wildlife habitat at all trophic levels of the food web... As described in EIS Section 3.5.1.1, the water present in Laguna Gatuna comes solely from surface water drainage after precipitation events*" Section 3.6.3 (Habitats and Traits of Laguna Gatuna). The DEIS is then directly self-contradictory and disregards previous acknowledgments of the potential for groundwater recharge by stating in the same Section that "*evaporation is the only natural mechanism for water loss and typically occurs quickly, leaving behind a slurry of salt and other minerals (Holtec, 2019a).*" It is NMED's technical experts' view that the potential for groundwater recharge exists through dolines, playa bottoms, and deformed, permeable strata has been insufficiently addressed and mischaracterized in the DEIS.

3.4 The DEIS also incorrectly states, "*Nash Draw and the Clayton Basin are topographic depressions to the west and southwest of the Querecho Plains. These depressions "probably" formed as a result of dissolution (i.e., dissolving) of Permian age anhydrite, gypsum, and halite beds (Vine, 1963)*" Section 3.4.1.1 (Physiography) of Section 3.4.1 (Regional Geology). It is now well accepted that the topographic depression of Nash Draw is solely due to karstic collapse of the land surface in response to underlying salt and evaporite dissolution (see Section 8.0 References, #12-20).

The New Mexico Environment Department (NMED) provides the U.S. Nuclear Regulatory Commission (NRC) this evaluation of the draft Environmental Impact Statement (DEIS) for Holtec International's (Holtec or Applicant) license application (Application) for a consolidated interim storage facility (CISF) for spent nuclear fuel and high-level wastes. NMED's evaluation is provided pursuant to the Memorandum of Understanding between NMED and NRC regarding NMED's cooperating agency status for Holtec's Application. Most significantly, NMED finds that the DEIS insufficiently evaluates the environmental impacts related to the following topics;

- the presence and chemistry of groundwater below the proposed CISF project area,
- the existence and possible effect of collapsed substrate due to dissolution below the proposed CISF project area,
- how surface water is regulated in New Mexico, and
- the NRC's long-term role in monitoring an environmental impact of the CISF, particularly in relation to non-radiological impacts.

NMED also provides its evaluation of other topics addressed in the DEIS that NMED groundwater and surface water technical experts consider important for a full and complete characterization of the proposed project and its environmental impact.

1.0 GROUNDWATER

1.1 The DEIS insufficiently and contradictorily suggests that groundwater in the vicinity of proposed CISF project area is not potable. "*No potable groundwater is known to exist in the vicinity (i.e., within ... [6 mi]) of the proposed CISF project area .... Shallow groundwater in the Cenozoic alluvium and Dockum Group is present in a number of wells in the surrounding area .... A few of these well are used for stock watering, but water quality and quantity are marginal at best ....*" Section 3.5.3.1 (Local Groundwater Use). "*The Santa Rosa Sandstone and other undifferentiated sandstones of the Triassic Dockum Group are the chief sources of groundwater in the eastern part of Eddy County .... The quality of water is generally sufficient for stock and domestic use .... The Santa Rosa Sandstone is the principal aquifer in the southwestern part of Lea County.*" Section 3.5.3.1 (Regional Groundwater Use). The DEIS inappropriately does not define "potable water."

Additionally, the DEIS provides no groundwater quality information for wells B106, B107 and B101 and numerous other shallow wells in the area as identified on Figure 3.5-5. Further, due to an insufficient number of exploratory boreholes and associated monitoring wells to the various saturated zones in the proposed CISF project area, NMED challenges the DEIS's assertion that there is an absence of potable water. Figure 3.5-5 illustrates numerous shallow wells in the vicinity of the CISF project area that, at a minimum, are used for stock watering ("windmill"). It appears that the perception of groundwater being of poor quality is the basis for the absence of a reference to a groundwater monitoring program to monitor environmental impact in the DEIS.

1.2 The DEIS inappropriately and contradictorily suggests that surface water protections are suitable substitutes for groundwater monitoring at the CISF. "*NPDES industrial stormwater permit requirements, Section 401 certification conditions (if required), and implementation of BMPs would protect groundwater quality in shallow aquifers.*" Section 4.5.2.1.1 (Construction Impacts). "*Negative impacts to groundwater quality in near-surface aquifers resulting from infiltration of stormwater and spills and leaks of fuels and*

lubricants would be mitigated by the implementation of the SWPPP, SPCC Plan, and the requirements of the NPDES permits." Section 5.5.2 (Groundwater).

That groundwater might be affected by surface water infiltration is expressed in the following statements. "*During construction of the proposed action [*and presumably afterward*], the groundwater quality of near-surface aquifers can potentially be affected by infiltration of stormwater runoff and leaks and spills of fuels and lubricants*." Section 4.5.2.1.1 (Construction Impacts). "*Impacts to groundwater at the proposed project area may result from pumping water (i.e., use of groundwater resources) to meet required consumptive water demands or from potential contamination due to leaks and spills of fuels and lubricants*." Section 4.5.2 (Groundwater Impacts).

That the primary source of radiological contamination would emanate from the spent nuclear fuel (SNF) storage pad and be incorporated into surface waters is expressed in the following statements. *"[T]he primary impact to surface water would be from runoff. The impervious SNF storage pad would be the primary source of runoff."* Section 5.1 (Surface Water Impacts). "*Holtec's environmental program would include a two-step process to detect any potential radiological contamination in surface water runoff .... First .... Second, soil samples would be collected on a quarterly basis at culverts leading to the proposed CISF project outfalls (i.e., discharge points)*." Section 4.5.1.1.2 (Surface Water Impacts-Operations Impacts). "*Quarterly soil sampling conducted in surface water drainage areas coupled with weekly and monthly radiological surveys on the casks and storage pad would be conducted ....*" Section 7.3 (Other Monitoring). The DEIS inappropriately does not propose long-term groundwater monitoring at the facility and instead relies solely on the surface water control and monitoring to evaluate environmental impact, despite acknowledged possible groundwater impact by both radiological and non-radiological contaminants. Further, NMED would expect innovative, real time and remote monitoring of potential radiological contamination versus traditional methods for all potential release sources and sites.

1.3 The DEIS inappropriately neglects to discuss New Mexico's groundwater protection standards listed at 20.6.2.3013 NMAC. It is unclear from the text whether the NRC considers the groundwater below the facility worthy of protection. NMED disagrees and an explanation is necessary.

Despite the fact that radionuclides are included in New Mexico's groundwater standards at 20.6.2.3103, the DEIS does not suggest the facility will be required to conduct groundwater monitoring for radionuclides (or non-radionuclides) and instead the DEIS implies the Applicant will rely on radiation monitoring at the surface. "*Radiation monitoring requirements are met by using area radiation monitors in the cask transfer building for monitoring general area dose rates from the casks and canisters during canister transfer operations, and with thermoluminescent dosimeters (TLDs) along the perimeters of the restricted and controlled areas*." Section 7.2 (Radiological Monitoring and Reporting).

The Applicant suggests a New Mexico groundwater discharge permit is necessary, however this suggestion is not carried over into the DEIS. "*Permits related to water must be obtained for pre-licensing and site construction and CIS Facility operation. The purpose of these permits is to address the various potential impacts on water and provide mitigation as needed to maintain state water quality standards and avoid any degradation to water resources at or near the site.*" Application Section 4.5.1 (Construction Impacts (Phase 1)). The DEIS fails to acknowledge that groundwater in New Mexico with a total dissolved concentration of 10,000 mg/L or less is subject to New Mexico regulation (20.6.2 NMAC), including complete characterization and monitoring at the proposed CISF project area via a ground water quality discharge permit. If required, a groundwater discharge permit for the CISF would be

3.5 The Final Detailed Siting Report, Eddy-Lea Siting Study dated April 28, 2007, states that "*Powers et al. (1978) characterized Laguna Plata, Laguna Gatuna, and other depressions in the area of the Site as "blowouts", having been formed by wind erosion, rather than by solution subsidence. This conclusion is supported by the presence of large downwind sand dune fields identified by Bachman (1974).*" The cited references do not factually support the statement of the Siting Study (2007), which is an unsubstantiated assertion that is transposed into the DEIS. Powers et al. (1978) acknowledge that Laguna Grande de la Sal of Nash Draw is "*an area of coalesced collapse dissolution sinks*" but then assert without any geologic evidence that "*Laguna Plata and Laguna Gatuna appear to have formed as solution blowouts in windborne sand deposits.*" Bachman (1974) only cites the presence of dune fields accompanying the playas to suggest they are "*blowouts.*" NMED recognizes that the dunes are, in part, the result of windblown scour from the playa bottom during dry periods; however, the presence of dunes does not explain the topographic depression that holds the playa from which sand is then eroded. The Siting Study (2007) relies on conjecture absent of geologic evidence for the formation of Laguna Plata and Laguna Gatuna and disregards the subsurface geology and site-specific geologic mechanisms in the discussion of the genesis of the playas.

3.6 The Final Boring Logs included in the HI-STORE CISF Phase 1 Site Characterization by GEI Consultants (2017) describe observations of pervasive deformation and occurrences of moisture (i.e., B102, B107, B108) in the subsurface strata (e.g., Chinle Formation), specifically documented as slickensides, vertical to sub-horizontal fractures of many inches in length, and highly fractured zones in core sections (e.g, B101, B102, B105, B106, B107, B109). The presence of subsurface deformation observed as pervasively fractured zones in the core sections as well as the presence of moisture at various depths in various boreholes is insufficiently addressed by the DEIS.

3.7 It is generally accepted that regionally surrounding the proposed CISF that karst processes may form a surface expression through a 3 stage process: (1) upward movement of groundwater dissolves cavernous voids; (2) the upward migration of voids through roof collapse (i.e., "stoping"); and (3) collapse ultimately reaches the surface which allows for direct downward infiltration of precipitation through the vertical system of fractures which exacerbates further dissolution of deep soluble strata (see Section 8.0 References, #21-33). The observations of pervasively fractured zones and moisture in the subsurface as documented by GEI Consultants (2017) needs to be addressed by the DEIS in the context of the previously mentioned karst processes. The DEIS cites Zhang et al., (2018) who used interferometric satellite image analysis to inexpensively and easily monitor ground surface subsidence along the northern margin of Nash Draw on a monthly frequency and at centimeter scales. These findings are insufficiently addressed by the DEIS and the Applicant needs to employ these techniques at the proposed CISF site to adequately address the previously mentioned processes. Shallow subsurface karst features can easily be hidden from the surface due to the nature of windblown erosion and sediment carried by precipitation events in to infiltration zones, but can be readily identified through detailed geophysical survey techniques (i.e., electrical resistivity tomography, ground penetrating radar, acoustic and active source seismic surveys).

3.8 The DEIS includes numerous references to natural and human caused lithologic dissolution processes and resultant land surface subsidence features that might impact the CISF and associated groundwater. However, the DEIS insufficiently addresses, and in fact inappropriately discounts, the presence of these processes and features at the CISF. "*Operation of the proposed action (Phase 1) and Phases 2-20 would not be expected to impact the potential for seismic events, sinkhole development, or*

subsidence." Section 4.4.1.2 (Operations Impacts). Possible solution features are addressed, "*[t]he topography of the Pecos Valley section is characterized by areas of interior drainage resulting from collapse due to solution….*" Section 3.4.1.1 (Physiography).

Sinkholes and karst are addressed: "*[s]inkholes and karst fissures formed in gypsum bedrock are common features of the lower Pecos region of west Texas and southeastern New Mexico. New sinkholes form almost annually, often associated with upward artesian flow of groundwater from regional karstic aquifers that underline evaporitic rocks at the surface …. A number of these sinkholes are of anthropogenic (man-made) origin and are associated with improperly cased abandoned oil and water wells, or with solution mining of salt beds in the shallow subsurface ….*" Section 3.4.5 (Subsidence and Sinkholes). "*The location of anthropogenic sinkholes and dissolution features in southeastern New Mexico and west Texas … include the Wink, Jal, Jim's Water Service, Loco Hills, and Denver City sinkholes and the I&W Brine Well. All of these features formed around a well location and the sinkholes have diameters ranging from … [100 to over 700 ft] in diameter.*" Section 3.4.5 (Subsidence and Sinkholes). "*Within the proposed CISF project area, there is an operating gas well and 18 plugged and abandoned wells.*" Section 5.5.1 (Surface Water). "*The Wink sinkholes … approximately … [75 mi] southeast of the proposed CISF project area … probably formed by dissolution of salt beds in the upper Permian Salado Formation that resulted from an improperly-cased abandoned oil well.*" Section 3.4.5 (Subsidence and Sinkholes).

Subsidence is also addressed: "*[r]ecent studies employing satellite imagery have identified movement of the ground surface across [large areas]. In one area as much as … [40 in] of subsidence was identified over the past 2.5 years. The rapid sinking in this area is most likely caused by water leaking through abandoned wells into the Salado Formation and dissolving salt layers ….*" Section 3.4.5 (Subsidence and Sinkholes). "*Another recent study employing satellite imagery identified a significant amount of subsidence in several distinct areas located within potash mining areas east of Carlsbad …. Subsidence caused by potash mining results from the collapse of strata above the mining level. In response to this collapse, the overlying and surrounding rock deforms, which may result in surface collapse (subsidence) and potential sinkhole development.*" Section 3.4.5 (Subsidence and Sinkholes).

The occurrence of potash is addressed at Application Figure 3.1.5 (Secretary's Potash Area), which illustrates that the CIS Facility is underlain by potash. Further, that potash and associated mining occurs proximal to the CISF is illustrated, "*Order 3324, "Oil, Gas, and Potash Leasing and Development Within Designated Potash Area of Eddy and Lea Counties, NM" (77 FR 71814). This order provides procedures and guidelines for orderly co-development of oil and gas and potash resources within the Designated Potash Area (DPA) in southeastern New Mexico (which includes the proposed CISF project area). Under this order, the oil and gas industry use drilling islands established by BLM from which all new drilling of vertical, directional, and horizontal wells that penetrate potash formations are allowed in order to manage the impact on potash resources. As described in EIS Section 3.2.4, the Belco Shallow and Belco Deep drill islands are located approximately … [0.25 mi] and … [0.5 mi] west of the proposed project area, respectively, and the Green Frog Café drill island is located outside the eastern boundary of the proposed project area.*" Section 4.2.1.1 (Construction Impacts).

Dissolution's impact on the structural component of the CISF is discussed as follows: "*[o]peration of the proposed action (Phase 1) and Phases 2-20 would not be expected to impact underlying bedrock because storage structures are passive and designed to robustly contain radiological materials.*" Section 4.4.1.2

(Operations Impacts). *"The Support Foundation Pad (SFP) is the underground pad which supports the HI-STORM UMAX [Vertical Ventilated Modules (VVM) or "canisters"] ... The SFP on which the VVM rests must be designed to minimize long-term settlement and must have sufficient strength to support the weight of all the loaded VVMs during long-term storage and earthquake conditions."* Application Section 2.2.2.2 (Support Foundation Pad). NMED questions if possible subsidence is the basis for the significantly robust proposed Support Foundation Pad.

3.9 The DEIS insufficiently addresses the potential for seismic activity at the CISF. *"Site selection for the GNEP (Global Nuclear Energy Partnership) nuclear facilities was based on the following minimum criteria specified by DOE: ... Seismic Stability: The proposed site must be free of risk from significant seismic events."* Application Section 2.3 (Site Selection Process). The Application does not define "significant seismic event." *"In recent years, fluid injection and hydrocarbon production have been identified as potential triggering mechanisms for numerous earthquakes that have occurred in the Permian Basin ...."* Section 4.4.1.2 (Operations Impacts). *"Potential seismic impacts at the proposed project site are evaluated in the NRC safety evaluation report [SER], including the potential for oil and gas exploration and development activities to induce earthquakes or any other major ground motion."* Section 4.4.1.2 (Operations Impacts). The SER was not provided to NMED and therefore the agency cannot comment of the significance of seismic activity to the possible environmental impact at this time. NRC must make the SER public during the EIS process for public review and comment. However, NMED is concerned about the effect of seismic activity on the competence of the subsurface lithology and its associated hydrology, particularly given ongoing oil and natural gas exploration and production in the Permian Basin, which includes significant underground injection of produced water.

3.10 The DEIS inappropriately discounts the possibility of subsidence because the lithologic formations below the CISF are relatively deep. *"The potential for sinkhole development or subsidence is low because (i) plugged and abandoned wells within the proposed project area are located outside the 133.5 ha [330 ac] storage and operations area, (ii) the proposed CISF project does not produce any liquid effluent that could facilitate dissolution, and (iii) no thick sections of soluble rocks are present at or near the land surface."* Section 4.4.1.2 (Operations Impacts). *"The shallowest formation containing relatively thick soluble materials (i.e., gypsum and halite) is the Rustler Formation, which is located at least ... [1,100 ft] below ground surface, which is over ... [1,000 ft] below the depth of the CISF facility design and is unlikely to be impacted by the proposed CISF project. Therefore, due to the subsurface geologic conditions and because the proposed CISF project operations do not produce any liquid effluent that could facilitate dissolution of halite and gypsum, the NRC staff does not anticipate that the proposed CISF would lead to the development of sinkholes or subsidence."* Section 4.4.1.2 (Operations Impacts).

However, a recognition that subsidence is possible is reflected in the statement, *"[n]ew sinkholes form almost annually, often associated with upward artesian flow of groundwater from regional karstic aquifers that underline evaporitic rocks at the surface ...."* Section 3.4.5 (Subsidence and Sinkholes). *"The Wink sinkholes ... approximately ... [75 mi] southeast of the proposed CISF project area ... probably formed by dissolution of salt beds in the upper Permian Salado Formation that resulted from an improperly-cased abandoned oil well."* Section 3.4.5 (Subsidence and Sinkholes).

"Recent studies employing satellite imagery have identified movement of the ground surface across [large areas]. In one area as much as ... [40 in] of subsidence was identified over the past 2.5 years. The rapid sinking in this area is most likely caused by water leaking through abandoned wells into the Salado

Formation and dissolving salt layers …." Section 3.4.5 (Subsidence and Sinkholes). "*Another recent study employing satellite imagery identified a significant amount of subsidence in several distinct areas located within potash mining areas east of Carlsbad …. Subsidence caused by potash mining results from the collapse of strata above the mining level. In response to this collapse, the overlying and surrounding rock deforms, which may result in surface collapse (subsidence) and potential sinkhole development.*" Section 3.4.5 (Subsidence and Sinkholes).

The need for NRC to further consider subsidence is expressed in the statement, "*[f]actors to consider for the cumulative impact determination for geology and soil resources include: (i) the systems, plans, and procedures that would be in place to limit soil loss, avoid soil contamination, and minimize stormwater runoff; (ii) available information showing that the proposed project area is in an areas of low seismic risk from natural phenomena and is not likely to be affected by significant induced seismicity from oil and gas production and wastewater injection; (iii) a low potential for sinkhole development due to the absence of soluble rocks at or near the land surface; (iv) available information showing a low potential for subsidence from past potash mining; and (v) the reclamation and decommissioning that would take place to return the proposed project area to preoperational conditions through return of topsoil, removal of contaminated soils, and reestablishment of vegetation.*" Section 5.4.1 (Summary).

3.11 The DEIS insufficiently explains the origin of Laguna Gatuna and Laguna Plata, and the numerous other playas proximal to the CISF. "*Prominent features of the Querecho Plains include four playas, or dry lakes: Laguna Plata, Laguna Gatuna, Laguna Toston, and Laguna Tonto. The CISF site is located between Laguna Gatuna and Laguna Plata …. The literature indicates that these lagunas may be a result of wind-blown erosion, dissolution and subsidence, or a combination of these two processes. Bachman (1973) cited written communication from C. L. Jones, U.S. Geological Survey (1973), stating that Laguna Plata and Laguna Gatuna are primarily depressions caused by deflation with accompanying fields of dunes, and that there is no indication that solution of underlying salt has contributed to the formation of these large depressions. However, [other authors] indicate that these lagunas are the result of dissolution and subsidence of the evaporites in the underlying Rustler Formation*." Application Section 3.3.1.3 (Regional Physiographic Features). "*The dissolution and subsidence are long-term geologic processes. The formation of the lagunas does not appear to be a recent event due to the lack of clearly defined scarps or stratigraphic discontinuities at the margins of the lagunas*." Application Section 3.3.1.3 (Regional Physiographic Features).

The DEIS inappropriately argues that the playas are not the result of dissolution in the following superficial evaluations. "*During site reconnaissance, detailed inspection of the areas around the margins of Laguna Gatuna and tributary drainages was performed to identify any tension cracks, disrupted soils, tilting, or other evidence of rapid earth displacement. No tension cracks or other evidence of displacement was observed. Additionally, older cultural features in the area were inspected to identify evidence of tilting, offset, or displacement that could indicate recent land movement. A number of oil wells were drilled along the west flank of Laguna Gatuna beginning in the early 1940's. Most of the wells were abandoned by 1975 and well monuments were installed; several of the well monuments were identified during site reconnaissance. None of the monuments displayed evidence of tilting that might be associated with local earth movements ….*" Application Section 3.3.3 (Salt Dissolution and Sink Holes). The Applicant did not do its due diligence in determining the origin of the playas and the subject warrants further investigation.

3.12 The DEIS insufficiently explains the environmental implications of shallow dissolution features, both existing and yet to be formed. *"Mescalero caliche is soluble and situated at or near land surface; however, this unit is no more than 10 feet in thickness. Local dissolution of this unit may have resulted in the development of a number of small shallow depressions in the area; however this is not regarded as an active or significant karst process at the Site ...."* Application Section 3.3.3 (Salt Dissolution and Sink Holes). NMED identifies in satellite photos numerous surface depressions within the CISF project area that may be shallow dissolution features.

4.0 SURFACE WATER

4.1 The DEIS should expand upon the NPDES permitting process in New Mexico. As New Mexico is one of three states that do not have primacy of the program, EPA Region 6 is the permitting authority. Once a federal permit is proposed, NMED reviews the permit and provides a Clean Water Act Section 401 Certification of the federal permit to ensure that it complies with state law, such as New Mexico's Standards for Interstate and Intrastate Surface Waters at 20.6.4 NMAC and the New Mexico Water Quality Act at NMSA 1978 §§ 74-6-1 to -17. For General Permits, such as the Construction General Permit (CGP) and the Multi Sector General Permit for Stormwater Discharges Associated with Industrial Activity (MSGP), NMED provides one 401 Certification for the entire general permit and does not provide 401 Certification for each Notice of Intent that is submitted for coverage under the general permit. In multiple sections, the DEIS implies that 401 Certification is an additional layer of protection from a regulatory perspective, but this mischaracterizes the applicability of the 401 process to this facility. The 401 Certifications have already been issued for the CGP and MSGP and would not apply specifically to the CISF.

The Construction General Permit (CGP) addresses stormwater runoff from construction sites that are greater than or equal to one acre in size. The permit approaches water quality protection under Best Management Practices (BMPs) and does not provide any numeric water quality monitoring requirements, but instead relies on periodic self-inspections by the permittee and monitoring and maintenance of installed physical and operational BMPs.

The Multi Sector General Permit (MSGP) addresses stormwater runoff from certain industrial activities as defined at 40 CFR Part 122.26(b)(14)(i)-(xi). These industrial activities are defined by Standard Industrial Classification Code (SIC Code) and are separated into industrial sectors in the permit, each with specific BMP requirements and water quality monitoring requirements. Holtec's CISF would likely require MSGP coverage under Sector P (Land Transportation and Warehousing), SIC Code 4226 for special storage. This sector does not currently require any water quality monitoring. An associated sector might be Sector K for Hazardous Waste Treatment, Storage or Disposal Facilities. It might be more appropriate for Holtec to consider applying for permit coverage under Sector AD – Stormwater Discharges Designated by the Director as Requiring Permits.

4.2 The DEIS describes the concrete batch plant that will be used for construction of the phases of the facility. Section 2.2.1.3 (Facility Construction). Since it will be solely associated with the Holtec facility, permit coverage for the activity can be incorporated into both the CGP and MSGP coverage that will be required. Management of the activities at the concrete batch plant needs to be incorporated into

the respective Stormwater Pollution Prevention Plans (SWPPPs) at each stage of the project (construction vs operational).

4.3 The DEIS has limited discussion of the Waters of the United States (WOTUS) issue and how that applies to this facility. Currently, the nation is subject to the guidance issued in accordance with the 1986 rule (40 CFR Part 230.3(s)), under which playa lakes are specifically included in the definition of WOTUS when there is the potential that they would be "used or could be used for industrial purposes by industries in interstate commerce." NMED interprets that Holtec would be required to obtain NPDES permit coverage under an appropriate permit/s for any surface water discharges from the facility. The proposed 2019 WOTUS rule has not yet been finalized, and until a final rule is issued and in effect, the 1986 definition applies. Regardless of any decisions on WOTUS, state surface water quality standards at 20.6.4 NMAC still apply to surface waters of the state, including playa lakes.

From an overall surface water quality perspective, general permits (CGP and MSGP) may not adequately address water quality concerns associated with surface water discharges from the facility. It is likely that an individual NPDES permit may be needed to address specific constituent concerns in lieu of coverage under the MSGP.

At a minimum, NMED the following constituents must be addressed in the monitoring requirements from the facility:

- Appropriate radionuclides addressed in 10 CFR 20 (due to the nature of the materials stored at the facility) in addition to radionuclides addressed in New Mexico's surface water quality standards at 20.6.4 NMAC
- Metals (magnesium, arsenic, cadmium, cyanide, lead, mercury, selenium, silver, chromium, zinc)
- Oil & Grease
- pH
- Ammonia
- Alpha terpineol, aniline, benzoic acid, naphthalene, p-Cresol, phenol, pyridine (ELGs for hazardous waste facilities)
- Chemical Oxygen Demand (COD), Total Suspended Solids (TSS)

4.4 There are a number of inaccuracies regarding permitting that need to be amended. Because the assumption is being made that only the CGP and MSGP would be applicable to the facility at this point, Holtec would not need to obtain 401 Certification from NMED because it has already been provided for those general permits as an overall measure. Section 4.5.1 (Surface Water Impacts).

4.5 The playa lakes are surface waters of the state and subject to water quality standards at 20.6.4 NMAC. NMED interprets the DEIS to imply that the playas could be used themselves as retention structures for stormwater discharges from the facility. The DEIS should cover measures the Applicant would need to take to mitigate or treat contamination prior to discharge into these waterbodies. Section 4.5.1.1.1 (Construction Impacts).

4.6 The DEIS describes the need for a Spill Prevention Control and Countermeasures Plan (**SPCC**). An SPCC Plan is only required if there are plans to store more than 1,320 gallons (above ground) of oil at the

site. There was no mention of oil storage in the DEIS, so NMED is unsure of the actual need for an SPCC Plan for the facility. Section 5.5.1 (Surface Water).

4.7 The DEIS and the Application are inconsistent regarding which playa will receive surface water flow from the CISF. *"Surface water runoff from the approximately ... [330 ac] footprint of the facility would be able to be fully captured by Laguna Plata and Laguna Gatuna ...."* Section 5.5.1 (Surface Water). The Application states, *"[S]urface runoff will travel away from the proposed CISF site, predominantly to the northwest through a large arroyo to Laguna Plata .... Little, if any discharge from the CISF site will travel to Laguna Gatuna ...."* Application Section 3.5.1.1 (Lagunas). As the DEIS suggests, surface water monitoring is the principal method of determining an environmental impact and the flow path of this water needs to be definitively identified.

4.8 The DEIS must be clarified regarding the source of salts in the playas. *"Surface drainage at the proposed CIS Facility site is contained within two local playa lakes that have no external drainage.... Surface runoff from the Site flows into Laguna Gatuna to the east and Laguna Plata to the northwest .... Surface water is lost through evaporation, resulting in high salinity conditions in soils associated with the playas ...."* Application Section 3.5.1 (Surface Water Resources). Elsewhere the DEIS attributes the salts in the playas to discharges from the oil and gas industry and the potash industry.

4.9 The DEIS fails to address the necessity to accurately measure seasonal variations of playa water levels and resultant subsurface infiltration. *"Laguna Gatuna is generally dry. Water in the playa comes from surface water drainage after precipitation events. Precipitation events in this area are usually in the form of erratic, unpredictable, and sometimes violent thunderstorms, which can leave several centimeters [inches] of rainfall in Laguna Gatuna in a relatively short period of time .... Historically, the months of July and August are the wettest of the year."* Section 3.5.1 (Surface Water Resources). Measurement of the variation will assist with understanding the hydrologic relationship between the playas and nearby groundwater, which is essential for the facility to properly regulated for environmental impacts.

4.10 On the Southern High Plains in eastern New Mexico, there are two different types of playas—the small circular freshwater playas and the larger and more irregular saline playas (Reeves and Parry, 1969). Though both playa types appear to share many common features, the saline playas are not equivalent in either form or origin to the circular playas (Sabine and Holliday, 1995). Note that playas are specifically mentioned in 20.6.4 NMAC as surface waters of the State of New Mexico. Playas are the only source of surface water in the Eastern Plains and must be protected as such.

Runoff that collects in circular playas, by drainage through natural draws and erosion gullies, overland flow, or direct precipitation, slowly drains to the receiving aquifer; or in areas where precipitation events are brief and infrequent annually, it may be captured in the vadose zone at least temporarily. Note that direct evaporation from the playa as stated in the DEIS is not the only pathway in which surface water leaves these circular playas. Shrink-swell clay soils in the bottom of the playa display large vertical fractures when dry. These fractures are pathways for the first flush of precipitation to travel to the underlying strata. As they are wetted, the fractures close and the siltier-sandier soils around the fringe of these playas (the annulus) also provides a pathway for surface water to underlying strata.

Satellite imagery shows a minimum of 20 circular playas within the proposed CISF project area. The circular playas that are located within the project area are potential pathways to groundwater. They can

concentrate pollutants because of their basin nature, but also are pathways to groundwater either by direct drainage below the playa or by fracture zones that connect playa underground flow.

Playas are extremely important when wet to a variety of wildlife. Playas are important resting, feeding and nesting habitat for migratory birds along the Central Flyway as well as resident birds. They provide habitat, forage and cover for terrestrial vertebrates and invertebrates adapted to their seasonal and variable wetland conditions. Furthermore, playa clusters are valuable because they provide refugia to many wildlife species including those with limited ability to move from playa to playa. In the proposed Holtec footprint, the playas are situated in clusters. Where playas are the only source of nearby surface water, they can attract many species of wildlife, often in high concentrations. Satellite imagery such as Google Earth shows cattle and wildlife trails radiating from playas and demonstrates the importance and frequency that playas are used as a sole water source and a magnet for domestic ungulates and wildlife use. The DEIS must not only address threatened and endangered species but all wildlife species and their use of surface water resources in remote regions such as this location in Lea County.

The DEIS must, at a minimum, clarify or address the following issues:

- Map all circular playas within the footprint of the proposed CIS project area and within the footprint of planned associated infrastructure, e.g., railroads connections and roads.
- Map and analyze all drainageways that drain to playas that cross the project footprint and associated planned infrastructure footprint.
- Sample circular playa soils to determine shrink/swell clay content and depth.
- Sample vegetation as an indicator of playa inundation frequency.
- Install instrumentation to measure infiltration below circular playa and annulus.

The DEIS must, at a minimum, propose the following mitigation measures:

- Provide a 50-meter buffer around playa clusters to maintain at least some habitat requirements.
- A restriction to not build in, drain to, or modify circular playas in order to maintain their wetland functions.

(Note that the mitigation measures above are provided to oil and gas producers in the area and NMED supports consistent application across other industrial sectors.)

Larger and more irregular saline playas such as Laguna Gatuna are in or may have been in close contact with the saturated zone of the underlying aquifer (as evidenced by springs) (Holliday et al., 1996). The springs may have dried up from groundwater pumping of the shallow aquifer or as a consequence of oil and gas production or may be still discharging continuously or intermittently. A salt-encrusted clay surface develops as surface runoff and groundwater discharge evaporates. High salinity levels prevent plant growth leaving the bare playa surface highly susceptible to aeolian deflation. During periods of aeolian activity, clay aggregates are dislodged and transported across the playa surface. Fine fractions become suspended and form dust plumes that may extend great distances. Coarse grains are deposited near the partially vegetated playa margins where they form clay dunes, also referred to as fringing dunes or lunettes (Bowler, 1968; Reeves and Parry, 1969; Bowler, 1973). During periods of heavy rain, some of the dune sediments wash back onto the playa surface where they eventually dry out and become source material for future aeolian transport. This process sets up a continuous cycle of aeolian deflation and transport of playa sediments to the fringing dunes and fluvial erosion and transport of

dune sediments back to the playa surface. Spring rainfall and associated runoff often moistens the playa surface, which significantly increases threshold velocity, and essentially shuts down saltation activity despite strong winds. The surface discharge and ponded water in Laguna Gatuna is not adequately described in the DEIS to determine the impacts of the facility to the natural functions of the wetland.

4.11 Sandhill Cranes use saline lakes such as Laguna Gatuna from October to March as winter habitat. Raptors such as Bald Eagles follow cranes and other waterfowl to feed on these species during the winter months as well. The DEIS does not adequately address the impacts on wintering birds at Laguna Gatuna and the impacts on invertebrates within Laguna Gatuna that wildlife such as sandhill cranes feed upon.

4.12 The DEIS provides little data regarding surface water resources. Additional information is needed to provide land managers, agencies, and the public fair and sufficient information to make informed decisions about the impact of the development of the CISF to store radioactive waste.

5.0 WASTE MATERIALS

5.1 The DEIS insufficiently addresses hazardous waste, in particular the processes generating this waste, its management, and the identification of the potential circumstances that might result in its release to the environment. The DEIS states, "*[f]or the proposed CISF, hazardous waste produced would primarily occur from the use of chemicals or other solvents. Hazardous waste would include any leaks resulting in spills of oil from operating equipment, or stormwater runoff carrying grease.*" Section 2.2.1.6 (Emissions, Waste Generation, Transportation). Spills of oil and grease in New Mexico do not usually constitute a hazardous waste and are instead considered a "special waste" with unique regulatory requirements. The DEIS states that oil and grease discharges would be managed under the NPDES permit requirements, however, there are no specific requirements in either the CGP or MSGP for oil and grease for these potential sectors in stormwater. In addition, based on NMED's experience with construction projects, we are surprised by the statement in the DEIS that hazardous wastes are not anticipated to be generated during construction. Table 2.2-3. The DEIS does not address a *drain system* in either the Cask Transfer Building or the Storage Building and does not address where that drain would discharge. NMED considers the possible mismanagement of hazardous waste to pose a substantial threat to the environment, including groundwater and surface waters of the state, and therefore see it as a topic necessitating a thorough evaluation in the DEIS. Because the DEIS does not describe management of hazardous waste, NMED is concerned about these materials ending up in stormwater that leaves the facility.

5.2 The DEIS insufficiently addresses sanitary waste, often referred to as "domestic waste," in particularly the existence of ancillary infrastructure, e.g., piping, from remote buildings that might manage non-sanitary, non-radiological waste. The DEIS states, "*[s]anitary waste produced from the proposed CISF would include waste from bathrooms, lavatories, mop sinks, and other similar fixtures located in the cask transfer building, security building, and administrative building. Sanitary wastewater will be contained using onsite sewage collection tanks and underground digestion tanks similar to septic tanks but with no drain field, and after testing the waste in the collection tanks to ensure 10 CFR Part 20 release criteria are met, the sewage will be disposed of at an offsite treatment facility....*" Section 2.2.1.6 (Emissions, Waste Generation, Transportation). Groundwater protection associated with sanitary waste is regulated in New Mexico at 20.6.2 NMAC. "*Onsite sewage would be routed to holding tanks.... Each*

holding tank would be periodically sampled (prior to pumping) and analyzed for relevant radionuclides …." Section 7.3 (Other Monitoring). The DEIS implies a drain system will connect rad material management areas to the domestic waste system. The DEIS needs to clarify how these plumbing systems are connected and specify the "relevant radionuclides."

Additionally, since there is a requirement to test the sanitary waste for constituents regulated under 10 CFR Part 20, and that the sewage will "be disposed of an at offsite treatment facility" (unnamed), the offsite treatment facility (if subject to its own NPDES permit) is required to address relevant federal pretreatment requirements. Any NPDES permit requires that the permittee prevent discharges to their system that:

- Create a fire or explosion hazard.
- Cause corrosive structural damage to the POTW but in no case lower than pH 5.0.
- Solid or viscous pollutants in amounts which will cause obstruction to the flow in the POTW.
- Any pollutant including oxygen demanding pollutants released in a discharge at a flow rate and/or pollutant concentration which will cause interference with the POTW.
- Heat in amounts which will inhibit biological activity in the POTW resulting in interference.
- Petroleum oil, nonbiodegradable cutting oil, or products or mineral oil origin in amounts that will cause pass through or interference.
- Pollutants which result in the presence of toxic gases, vapors or fumes within the POTW in a quantity that may cause acute worker health and safety problems.
- Any trucked or hauled pollutants except at discharge points designated by the POTW.

The volume of sanitary waste generated by the various stages of the proposed CISF is estimated to be approximately 3,000 gallons per day (gpd) as referenced in DEIS Table 2.2-3. In numerous places the DEIS states, *"[s]anitary wastewater will be contained using onsite sewage collection tanks and underground digestion tanks similar to septic tanks but with no drain field, and after testing the waste in the collection tanks to ensure 10 CFR Part 20 release criteria are met, the sewage will be disposed of at an offsite treatment facility."*

The DEIS needs to clarify the following issues:

- How the 2,999 gpd was calculated.
- The sizes of the proposed sewage collection tanks and underground digestion tanks.
- Whether the sewage collection tanks and underground digestion tanks operate in series or will they be individually plumbed.
- Whether the sewage collection tanks be above or below ground.
- How overflow will be prevented.
- Why the contents of the tanks would need to meet 10 CFR Part 20 – Standards for Protection Against Radiation Release Criteria.
- Whether solvents or chemicals will be released into the sink or floor drains.
- The identity of the offsite treatment facility accepting the sanitary wastewater.
- Whether the Applicant would be obligated to utilize a certified sanitary waste hauler and whether the process necessitates a waste transport manifest.
- Whether the facility will utilize a maintenance service agreement for pumping wastewater.

5.3 The DEIS insufficiently addresses low-level radioactive waste (LLRW). *"Solid wastes generated from the proposed CISF project would include nonhazardous solid waste, low-level radioactive waste (LLRW), and hazardous waste."* Section 3.13.2 (Solid Wastes). The DEIS insufficiently describes how, where and why low-level radioactive waste (LLRW) is generated at the facility.

The DEIS does not describe management or storage of the LLRW and therefore, NMED considers the possible mismanagement of LLRW to pose a substantial threat to the environment, and therefore a topic necessitating a thorough evaluation in the DEIS. Because the DEIS does not describe management or storage of the LLRW, NMED questions what prevents these contaminants from being incorporated into stormwater. The DEIS does not address a drain system in either the Cask Transfer Building or the Storage Building and does not address where that drain would discharge.

5.4 The DEIS insufficiently addresses mixed waste. *"Holtec proposes that ... mixed waste generated by the proposed CISF project would be sent to licensed facilities for disposal."* Section 3.13.2 (Solid Wastes). The DEIS should address how and where mixed waste will be generated at the CISF and any potential environmental impacts.

5.5 The DEIS must address the infrastructure (e.g., drains) managing all liquid non-sanitary and non-radiological waste in the Cask Transfer Building, the Storage Building, or anywhere these wastes are managed. The DEIS must address where these drains would discharge.

6.0 MITIGATIONS

6.1 The DEIS insufficiently addresses how NRC will be involved in the mitigation of environmental impacts. *"These conditions are written specifically into the NRC license and then become commitments that are enforced through periodic NRC inspections ...."* Section 6.1 (Introduction) Table 6.3-1 (Summary of Mitigation Measures Proposed by Holtec) references the *"[u]se of environmental monitoring program to detect potential radiological contamination ...,"* however it is unclear how NRC will be involved in this monitoring program and whether it involves monitoring groundwater. Table 6.3-1 states the Applicant will *"[r]eport all regulated substance spills that occur at the site to the NMED, and remediate in accordance with State requirements."* It is unclear what involvement NRC will have in these spills.

6.2 The DEIS insufficiently addresses how spill mitigation and decontamination procedures will minimize environmental impact. Table 6.3-2 states that the Applicant will "[u]se decontamination techniques that reduce waste generation ...." The DEIS needs to more thoroughly identify "decontamination techniques" and how these might impact the environment, particularly if liquid wash/rinse techniques are anticipated.

6.3 NRC must inform NMED of all anticipated license conditions resulting from the safety review that are relevant to the environmental impacts. The DEIS states, *"[r]equired monitoring programs or those proposed in the license application can be modified to address unique site-specific characteristics by adding license conditions to address findings from the [NRC] safety and environmental reviews. The NRC staff are conducting the safety review of the proposed CISF project, which will be documented in a Safety Evaluation Report (SER), and any license conditions resulting from the safety review that are relevant to the environmental impacts of the proposed action would be discussed in the final environmental impact statement (EIS)."* Section 7.1 (Introduction). *"The management of spills and leaks*

is not part of the routine environmental monitoring program described herein. Rather, spills and leaks, including the design of the infrastructure to detect leaks, are described in the NRC SER." Section 7.1 (Introduction). Upon completion of the SER, NMED requests the NRC share with NMED all anticipated license conditions resulting from the safety review that are relevant to possible environmental impacts.

6.4 The DEIS insufficiently addresses the radiological monitoring and reporting, particularly whether the monitoring is for radiation only or whether it includes monitoring for radiological elements or isotopes, and whether this monitoring pertains to groundwater. "*The radiological environmental monitoring program (REMP) includes the collection of data during preoperational years in order to establish baseline radiological information that would be used in determining and evaluating potential impacts from operation of the proposed CISF project on the local environment.*" Section 7.2 (Radiological Monitoring and Reporting). New Mexico has groundwater standards for both radiation, i.e., radium 226 & 228 alpha, and radionuclides, i.e., uranium and its associated isotopes.

"*The CIS Facility would conduct a comprehensive environmental sampling and analysis program, commonly referred to as the consolidated radiological environmental monitoring program (REMP)... This program also provides environmental data to demonstrate compliance with radiological effluent release standards contained in 10 CFR Part 20 Appendix B... The REMP will be initiated at least one year prior to CISF operations. The early initiation of the REMP will provide assurance that a sufficient environmental baseline has been established for the CISF before the arrival of the first cask shipment... The baseline will be established as follows: 1) Soil samples will be collected and analyzed for the presence of radiological constituents in areas where radiological operations will occur (e.g., rail cask transfer station, rail spur, Cask Transfer Building, and the HI-STORM UMAX storage pad and the immediate surrounding area around the pad, 2) Surface water samples will be collected and analyzed for the presence of radiological constituents in Laguna Gatuna and Laguna Plata, 3) Groundwater samples will be collected and analyzed for the presence of radiological constituents near the Cask Transfer Building, and the HI-STORM UMAX storage pad and the immediate surrounding area around the pad, 4) ....*" Application Section 4.12.3 (Summary of Environmental Monitoring Program). The DEIS needs to elaborate on the stormwater management procedures at the above refenced soil sampling locations and on the system to be used to monitor groundwater.

7.0 STATE PERMITS

7.1 The DEIS is significantly incomplete without inclusion of all applicable state regulatory oversite and environmental impact controls.

Regarding a groundwater discharge permit, NMED has not received a Notice of Intent (NOI) or application from Holtec. Generally, an application is preceded by an NOI to discharge per 20.6.2.1201 NMAC. The NOI form is available at https://www.env.nm.gov/gwqb/forms/. Based on the information we have reviewed about the proposed facility, we expect that an application will be necessary prior to construction. An NOI from Holtec will prompt NMED to make an official determination regarding whether the proposed activity requires a discharge permit.

Regarding hazardous waste generation and storage, the DEIS suggests the Applicant apply for an associated permit. Section 1.6.2 (Status of Permitting with Other Federal and State Agencies). A permit is not necessary for the generation of hazardous waste but may be necessary for the storage, dependent on quantity and storage duration. Elsewhere in the DEIS there is reference to the Applicant having

Conditionally Exempt Small Quantity Generator (CESQG) status, which would negate the need for a permit. The DEIS states that the facility would produce 1.2 metric tons of hazardous waste per year. Section 5.14 (Waste Management). The DEIS and the Application are inappropriately vague about how or why this waste would be generated. The DEIS only mentions "solvents and other chemicals." Regarding the necessity to notify NMED of anticipated hazardous waste activity in order to obtain an EPA Identification Number, NMED concurs.

Regarding mixed waste, the DEIS references the generation of such waste. Section 3.13.2 (Solid Wastes). The DEIS is inappropriately vague about how or why this waste would be generated.

Regarding a petroleum storage tank registration, NMED concurs that one would be necessary is one is to be utilized. The topic is not generally otherwise addressed in the DEIS.

Regarding the necessity of an EPA NPDES permit and a NPDES Construction Permit, see NMED comments above in Section 4, Surface Water.

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