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Southern California Edison
2016 IEPR-Nuclear 16-IEP-07 CEC-SCE-001

DATA REQUEST SET 16-IEP-07 CEC-SCE-001

To: CEC
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Dated: 05/25/2016

Question 1a:

Section 2: Nuclear Power Plant Data Request for Diablo Canyon Power Plant and San Onofre Nuclear Generation Station. Progress in Spent Nuclear Fuel On-site Management

A. Nuclear Waste Accumulation - Diablo Canyon and San Onofre

As follow-up to the 2013 and 2015 IEPR recommendations, the Energy Commission is requesting information from PG&E and SCE that pertain to the current status of onsite storage and disposal of low-level waste and spent nuclear fuel and their plans through plant decommissioning.

Please provide the most recent disposal plans and disposal cost assessments for low-level waste (categorized as Class A, B, C, or Greater-than Class-C) and spent nuclear fuel storage completed to satisfy this request.

Response to Question 1a:

Greater than Class C waste is not considered low level waste and must be disposed of in a manner similar to spent fuel.

San Onofre Unit 1 permanently retired in 1992, and Units 2&3 permanently retired in 2013. The units are being decommissioned and are not generating any more spent nuclear fuel.

The following tables, as provided in the most recent decommissioning cost estimates, summarize the most recent disposal plans and disposal cost assessments for low-level waste at the San Onofre units. All costs are shown at the 100% level in 2014 dollars.

San Onofre Unit 1

Table 6-4
Waste Disposal Volumes
(Cost Excludes Contingency - 2014 Dollars)

| Facility and Waste Class | Waste Weight (LBs) | Waste Volume (CF) | Burial Volume (CF) | Packaging Cost | Transportation Cost | Base Burial Cost | Total Disposal Cost |
|---|--------------------|-------------------|--------------------|------------------|---------------------|---------------------|---------------------|
| Class B, C & GTCC Facilities | | | | | | | |
| Class B & C | 1,525,000 | 7,598 | 7,598 | \$525,000 | \$16,800,000 | \$36,310,869 | \$53,635,869 |
| GTCC | 27,159 | 55 | 167 | \$0 | \$210,000 | \$3,440,770 | \$3,650,770 |
| | 1,552,159 | 7,654 | 7,765 | \$525,000 | \$17,010,000 | \$39,751,639 | \$57,286,639 |
| EnergySolutions | | | | | | | |
| Class A – Debris | 37,263 | 723 | 723 | \$733 | \$2,988 | \$46,214 | \$49,935 |
| Other | | | | | | | |
| Out of State Class III Landfill | 155,545,280 | 2,393,004 | 2,393,004 | \$0 | \$11,759,838 | \$3,633,106 | \$15,392,944 |
| Scrap Metal Recycler | 1,651,239 | 66,050 | 66,050 | \$0 | \$8,149 | \$0 | \$8,149 |
| | 157,196,519 | 2,459,054 | 2,459,054 | \$0 | \$11,767,987 | \$3,633,106 | \$15,401,093 |
| Grand Total | 158,785,941 | 2,467,431 | 2,467,542 | \$525,733 | \$28,780,975 | \$43,430,959 | \$72,737,667 |

San Onofre Units 2&3

Table 6-4
Waste Disposal Volumes
(Cost Excludes Contingency - 2014 Dollars)

| Facility and Waste Class | Waste Weight (LBs) | Waste Volume (CF) | Burial Volume (CF) | Packaging Cost | Transportation Cost | Base Burial Cost | Total Disposal Cost |
|---------------------------------|----------------------|-------------------|--------------------|---------------------|----------------------|----------------------|----------------------|
| Class B and C Facility | | | | | | | |
| Class B | 1,132,323 | 6,696 | 15,199 | \$1,199,186 | \$6,433,599 | \$72,635,570 | \$80,268,355 |
| Class C | 407,380 | 1,546 | 8,191 | \$2,064,309 | \$26,706,007 | \$39,142,870 | \$67,913,186 |
| GTCC | 92,861 | 190 | 1,882 | \$196,288 | \$1,680,000 | \$38,775,980 | \$40,652,268 |
| | 1,632,564 | 8,431 | 25,272 | \$3,459,782 | \$34,819,606 | \$150,554,420 | \$188,833,808 |
| EnergySolutions | | | | | | | |
| Class A – Debris | 200,560,122 | 3,229,506 | 3,308,050 | \$3,804,262 | \$13,779,286 | \$211,423,909 | \$229,007,458 |
| Class A – Oversize | 9,967,521 | 146,943 | 184,730 | \$187,314 | \$784,285 | \$22,669,947 | \$23,641,545 |
| Class A – Containerized Waste | 1,053,914 | 12,287 | 16,303 | \$397,152 | \$364,322 | \$4,112,378 | \$4,873,851 |
| Class A – Large Component | 11,480,200 | 108,866 | 136,373 | \$6,313,568 | \$69,622,664 | \$43,582,464 | \$119,518,696 |
| Class A – Mixed Waste | 62,643 | 3,012 | 3,012 | \$67,887 | \$12,448 | \$801,226 | \$881,561 |
| | 223,124,400 | 3,500,614 | 3,648,469 | \$10,770,182 | \$84,563,005 | \$282,589,924 | \$377,923,111 |
| Other | | | | | | | |
| Out of State Class III Landfill | 1,909,207,440 | 25,212,269 | 29,372,422 | \$0 | \$146,326,469 | \$43,929,750 | \$190,256,219 |
| Scrap Metal Recycler | 184,787,372 | 377,117 | 7,391,495 | \$0 | \$911,926 | \$0 | \$911,926 |
| | 2,093,994,812 | 25,589,386 | 36,763,917 | \$0 | \$147,238,394 | \$43,929,750 | \$191,168,144 |
| Grand Total | 2,318,751,776 | 29,098,431 | 40,437,658 | \$14,229,964 | \$266,621,006 | \$477,074,094 | \$757,925,064 |

SCE currently plans to ship the Class A waste to the EnergySolutions disposal facility at Clive, Utah, and the Class B&C waste to the Waste Control Specialists disposal facility at Andrews County, Texas. SCE plans to store the GTCC waste in canisters in the Independent Spent Fuel Storage Installation (ISFSI) at the San Onofre site until removal by the U.S. Department of Energy (DOE). For cost estimating purposes, SCE applies a 25% contingency factor to the costs stated in the tables above.

There are 395 Unit 1 spent fuel assemblies stored at the San Onofre site. All of these are stored

in canisters (dry storage) in the ISFSI, awaiting removal by DOE. In addition, there are 270 Unit 1 fuel assemblies stored at the General Electric-Hitachi facility in Morris, Illinois. These are currently stored in a wet pool, also awaiting removal by DOE. The estimated cost to store all Unit 1 fuel at the SONGS ISFSI until removal by DOE is \$25.6 million (100% share, 2014 \$).

There are 3460 Units 2&3 spent fuel assemblies stored at the San Onofre site. 792 of these are stored in canisters (dry storage) in the ISFSI, and 2668 are currently stored in wet pools. SCE plans to transfer all fuel to dry storage in the ISFSI by 2019. The estimated cost to store all Unit 2&3 fuel until removal by DOE is \$1,243.1 million (100% share, 2014 \$).

SCE currently anticipates that the DOE will remove and accept the San Onofre fuel assemblies during the 2024-2049 period.