

# Geothermal Permitting and NEPA Timelines



**2014 GRC Annual Meeting**

**Katherine R. Young, Kermit Witherbee,  
Aaron Levine, Adam Keller, Jeremy  
Balu, Mitchell Bennett**

**September 30, 2014**

## OVERVIEW

### BACKGROUND

- Types of NEPA-related Analyses
- Geothermal Timeline

### NEPA DATABASE

- Database Overview
- Documents Collected
- Document Sources
- Metadata Catalogued

### ANALYSIS

- NEPA Processing Timelines
- Proposed Activity and NEPA Types
- Impacts to NEPA Timelines

### POTENTIAL IMPROVEMENTS

- Combining NEPA Timelines
- Comprehensive POOs/PODs
- Tracking NEPA Timelines
- Expansive Applications

### CONCLUSIONS.

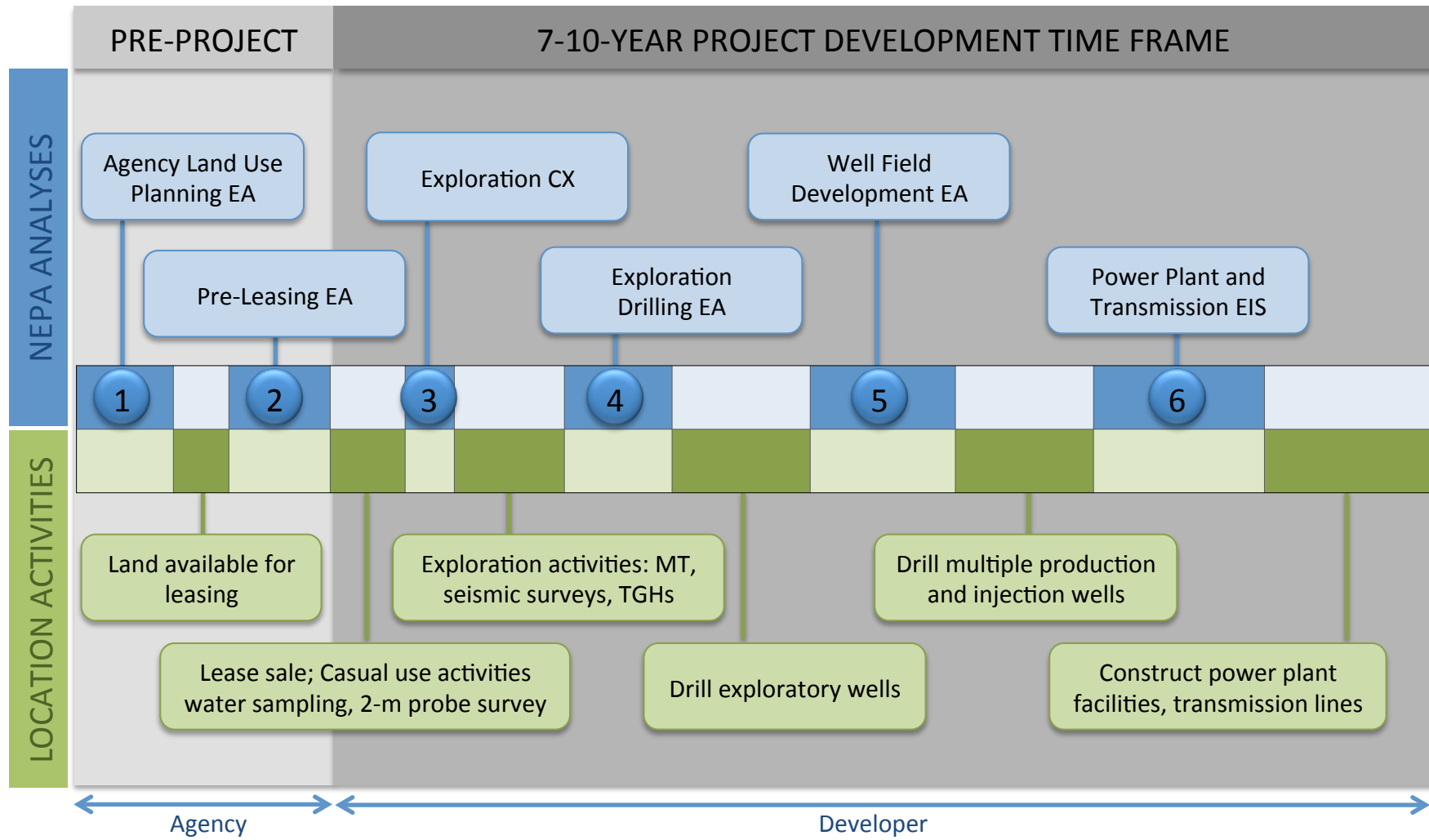
**BACKGROUND: Five Types of NEPA-related Analyses**

Federal Action Description	Resulting Environmental Review	Approximate Time frames	Comments
Action would not ordinarily result in significant disturbance <sup>1</sup> to federal lands, resources, or improvements	Casual Use (CU)	<1 month	A CU does not require any NEPA analysis and usually results from the review of a NOI for geothermal exploration.
Action that has been adequately analyzed under an existing NEPA document(s) and is in conformance with the land use plan	Determination of NEPA Adequacy (DNA)	1 month	Not all new proposed actions will require new environmental analysis. In some instances an existing EA or EIS may be relied upon in its entirety.
Action that the agency or Congress has determined does not have a significant effect <sup>1</sup> on the quality of the human environment <sup>2</sup> (individually or cumulatively)	Categorical Exclusion (CX)	2 months	A CU does not require any NEPA analysis. A CX can be established administratively through agency rulemaking or legislatively through congressional action.
Action that may significantly impact the environment	Environmental Assessment (EA)	10 months	EAs are conducted to determine whether action would significantly affect the environment. The EA process results in either a Finding of No Significant Impact (FONSI) or the preparation of an Environmental Impact Statement (EIS).
Major federal action that significantly affects the environment	Environmental Impact Statement (EIS)	25 months	The EIS process requires public participation for all federal agencies.



## BACKGROUND: NEPA Analyses in Geothermal Development

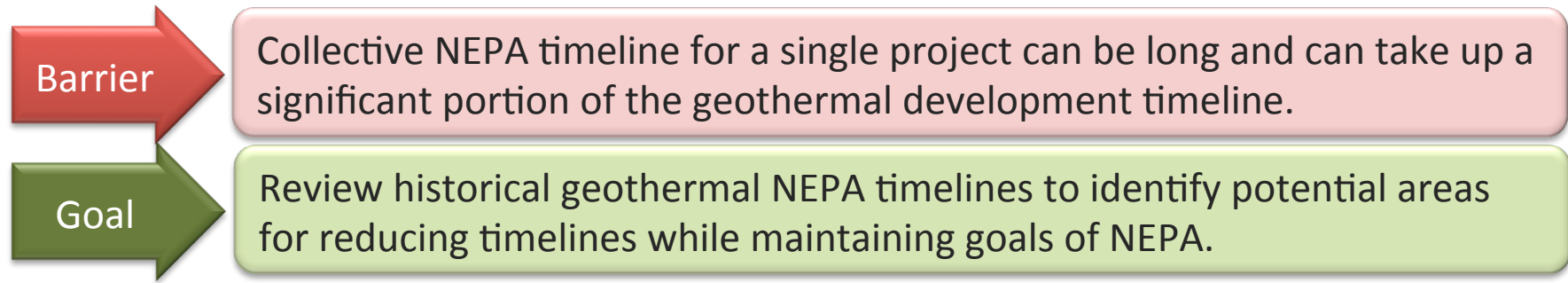
Geothermal development project can go through as many as six NEPA analyses, with interim activities providing the data required for future permit applications.



*This is a graphic is for illustrative purposes only. Not all projects will go through the all of these phases, and the order may change.*

## NEPA DATABASE: Overview

<http://en.openei.org/wiki/RAPID/NEPA>

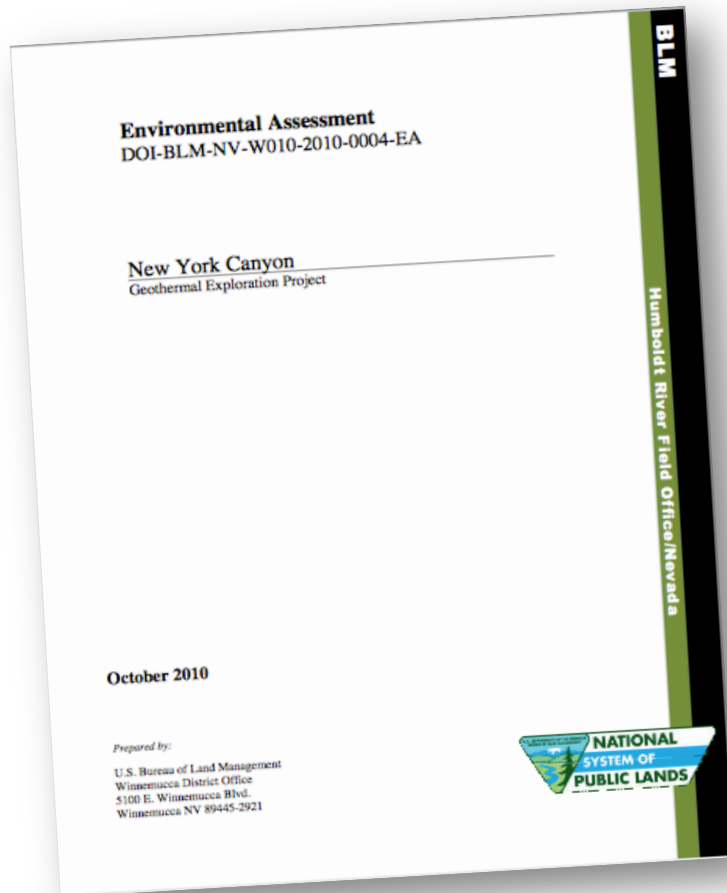


- NEPA creates administration record for permit decision making
- Data were collected to inform analyses of NEPA timelines
- Collected data were made publically available via NEPA Database in case others might find it useful
- NREL used a wiki platform to allow industry and agencies to maintain the content in the future (if desired) so that it continues to provide relevant information to users
- The long-term success of the NEPA Database will depend on the willingness of federal agencies, industry, and others to populate the database with NEPA and related documents, and to use the data for their own analyses
- As the information and capabilities of the database expand, developers and agencies can save time on new NEPA reports by accessing a single location to research related activities, their potential impacts, and previously proposed and imposed mitigation

NEPA DATABASE: Documents Collected <http://en.openei.org/wiki/RAPID/NEPA>

Types of documents collected include:

- Application Files
- CU Documents
- DNA Worksheets
- Categorical Exclusion Approvals
- BLM Serial Register Pages
- EA Reports
- EIS Reports
- Decision Record Documents
- FONSI Documents.



**NEPA DATABASE: Documents Collected** <http://en.openei.org/wiki/RAPID/NEPA>

Type of Document Collection	# of Database Entries	Permit Applications <sup>1</sup>	Reports	FONSI's	Decisions
Casual Use	26	18	19	NA	20
Determinations of NEPA Adequacy	30	1	27	NA	27
Categorical Exclusions	53	17	13 <i>(not common)</i>	NA	53
Environmental Assessments	61	2	50	39	17
Environmental Impact Statements	6	0	5	NA	4
<b>TOTALS</b>	<b>178</b>	<b>38</b>	<b>114</b>	<b>39</b>	<b>70</b>

<sup>1</sup>Note that we expect the number of permit applications collected in our database to be low (compared to the collection of other documents), because many of these are proprietary, and are therefore not included in this database. Only publically available permit applications were included in the database.

NEPA DATABASE: Document Sources

<http://en.openei.org/wiki/RAPID/NEPA>

Source	Type of Data	Comments on Available Data
<b>Internet Search</b>	EA and EIS reports	Some EA and EIS reports were available via the Internet, largely because they were <u>temporarily</u> being made available for public comment
<b>BLM eNEPA Database</b> <a href="https://www.blm.gov/epl-front-office/eplanning/nepa/nepa_register.do">https://www.blm.gov/epl-front-office/eplanning/nepa/nepa_register.do</a>	CX and DNA Worksheets, EA and EIS reports for BLM projects	Records date from 2011; they contain links to CX, DNA, EA, and EIS documents; not complete for all offices
<b>BLM LR2000</b> <a href="http://www.blm.gov/lr2000/">http://www.blm.gov/lr2000/</a>	BLM serial register pages with dates	BLM serial register pages (Case records for transaction records of leases, Rights-of Way, Notices of Intent for exploration); records date from 1970s
<b>Individual BLM Field Office Websites</b>	EA and EIS reports open for public comment for BLM projects	NEPA documents that are <u>temporarily</u> available: some offices' records date back to 2008; not complete for all offices; must know that documents exist as offices do not maintain a list of geothermal projects
<b>Field Office Paper Files</b>	BLM reports, applications, FONSI, decisions	Geothermal project files; records date from 1980s and are the most complete source; document numbers are required for request
<b>DOE NEPA Database</b> <a href="http://energy.gov/nepa/nepa-documents">http://energy.gov/nepa/nepa-documents</a>	Reports, FONSI, decisions, for DOE projects	Reported to have a complete set of data for DOE-led NEPA analyses from 2008 to the present



NEPA DATABASE: Metadata Catalogued <http://en.openei.org/wiki/RAPID/NEPA>

**Data Type**

**Example metadata**

**Project Data**

Applicant, location, proposed activity, lease information, lead agency

**Timeline Data**

Application date, public comment period, decision date

**Resource Analysis Data**

Potential impact (present; present, not affected; present, potentially affected; not indicated) and proposed/imposed mitigation.

**Resource Analysis**

Resource	Not Present	Present, Not Affected	Present, Potentially Affected	Not Indicated	Comment	Applicant Proposed Mitigation	Agency Imposed Mitigation
Air Quality			✓				
Areas of Critical Environmental Concern	✓						
Cultural Resources			✓				✓
Environmental Justice	✓						
Floodplains	✓						
Invasive, Nonnative Species			✓			✓	
Migratory Birds			✓			✓	
Native American Concerns			✓				

**Air Quality: Applicant Proposed Mitigation**

Post and enforce speed limits to reduce fugitive dust (speed limit of 15 miles per hour, as necessary).  
 Apply dust abatement techniques (such as watering, requiring loader buckets to be emptied slowly, minimizing drop heights, etc.) to earthmoving, excavating, trenching, and grading activities.

Minimize equipment and vehicle idling times during construction activities.

Close

## ANALYSIS: NEPA Processing Times

Resulting Environmental Review	Approximate Time frames	Comments
Casual Use (CU)	<1 month	CU does not require any NEPA analysis and usually results from the review of a NOI for geothermal exploration.
Determination of NEPA Adequacy (DNA)	1 month	Not all new proposed actions will require new environmental analysis. In some instances an existing EA or EIS may be relied upon in its entirety.
Categorical Exclusion (CX)	2 months	A CX can be established administratively through agency rulemaking or legislatively through congressional action.
Environmental Assessment (EA)	10 months	EAs are conducted to determine whether action would significantly affect the environment. The EA process results in either a Finding of No Significant Impact (FONSI) or the preparation of an Environmental Impact Statement (EIS).
Environmental Impact Statement (EIS)	25 months	The EIS process requires public participation for all federal agencies.

NEPA Timeline  
Reduction Potential

Utilizing CUs, DNAs, and CXs whenever possible can help to reduce cumulative NEPA timelines.

## ANALYSIS: Proposed Activity and NEPA Type

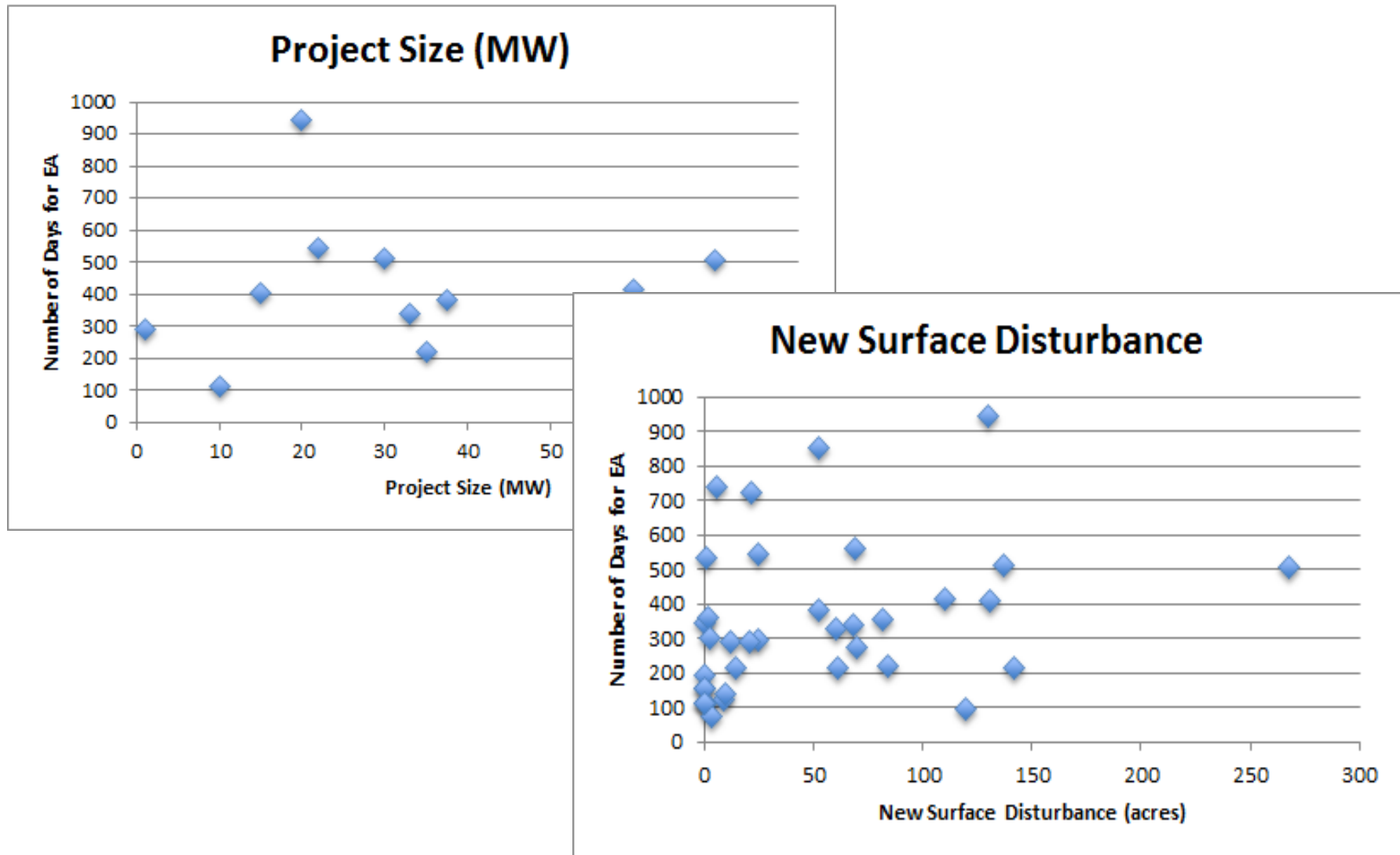
Activity	Permit Applications <sup>2</sup>												Total
	Notice of Intent to Conduct Exploration				Geothermal Drilling Permit <sup>3</sup>			Plan of Operations/Plan of Development <sup>3</sup>			Plan of Utilization <sup>3</sup>		
	CU	CX	DNA	EA	CX	DNA	EA	DNA	EA	EIS	EA	EIS	
<b>Surface Exploration</b>													
Water Sampling	2												2
2-Meter Probe	2	1											3
TGH		9	5	3			1		1				19
<b>Geophysical Exploration</b>													
Electrical/MT/Gravity	20	11									1		32
Seismic	1	11											12
Unknown (NOI Unavailable)		13											13
<b>Drilling</b>													
Exploration Drilling (excluding TGH)				1		2	3		10				16
Development Drilling					1	15	4						20
Well Field Development						1		1	7				9
<b>Power Plant</b>													
Power Plant											7	3	10
<b>Totals</b>	<b>25</b>	<b>45</b>	<b>5</b>	<b>4</b>	<b>1</b>	<b>18</b>	<b>8</b>	<b>1</b>	<b>18</b>		<b>8</b>	<b>3</b>	<b>136</b>

<sup>1</sup> Documents in NEPA Database adequate for analysis

<sup>2</sup> NEPA Analysis: CU-Casual Use, CX-Categorical Exclusion, DNA-Determination of NEPA Adequacy, EA-Environmental Assessment, EIS-Environmental Impact Statement

<sup>3</sup>Some GDP, POO, POD, and POU EAs included in the above table overlapped and are represented for each category to which they applied.

# ANALYSIS: Potential Impacts to NEPA Timelines



**ANALYSIS: Potential Impacts to NEPA Timelines**

Variable	# of Yes (of 39 EAs)	Average # of Days			Median # of Days		
		Yes	No	Difference	Yes	No	Difference
Native American Concerns?	25	368.8	307.3	61.5	337	256.5	80.5
Significant Tribal Comment?	9	400.9	330.4	70.5	354	297	57
Significant Public Comment?	5	428.8	317.8	111.0	456	309.5	146.5
ESA Species present?	3	404.7	341.9	62.8	380	311.5	68.5
Migratory Birds Present?	36	364.8	119.0	245.8	331.5	155	176.5
BLMSSS Present?	33	388.1	119.0	269.1	337	113	224
Exceptional Concern for Ambient Environment?	10	361.0	341.8	19.2	331.5	296	35.5

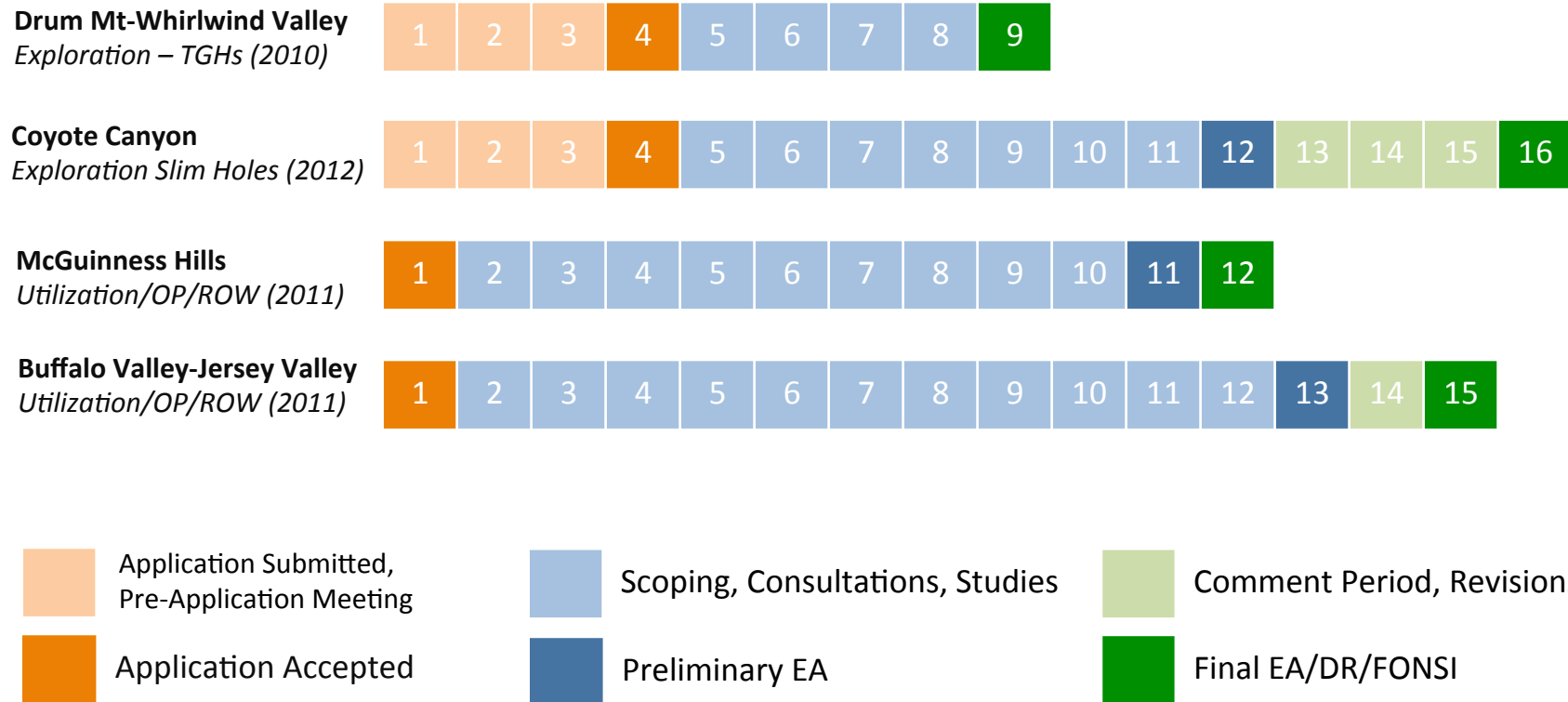


Actively engaging with tribes and the public, and avoiding areas containing wildlife protected under the Endangered Species Act (ESA), when possible



POTENTIAL IMPROVEMENTS: Tracking NEPA Timelines

Example Timelines for Environmental Assessments (in months)



## POTENTIAL IMPROVEMENTS: Tracking NEPA Timelines

### Anecdotal Suggestions for Delays in Permit Processing

- **When was permit submitted?**

Timing may make a difference. Submitting during the following timeframes may cause a delayed start to permit processing

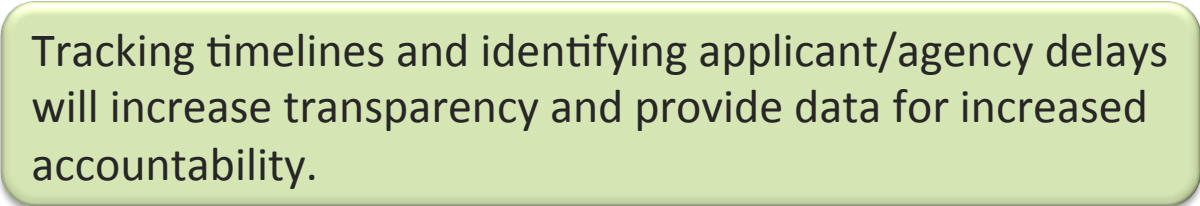
  - August (vacation season)
  - Thanksgiving/Christmas
  - Fire season
- **Is the project a priority project for the developer?**

Sometimes developers submit permits on non-priority projects, but spend more effort pushing priority projects through the permitting process. This may make average timelines look longer than necessary.
- **Has the developer changed the project design?**

Changing project design after the permitting process has already begun will likely cause processing delays.



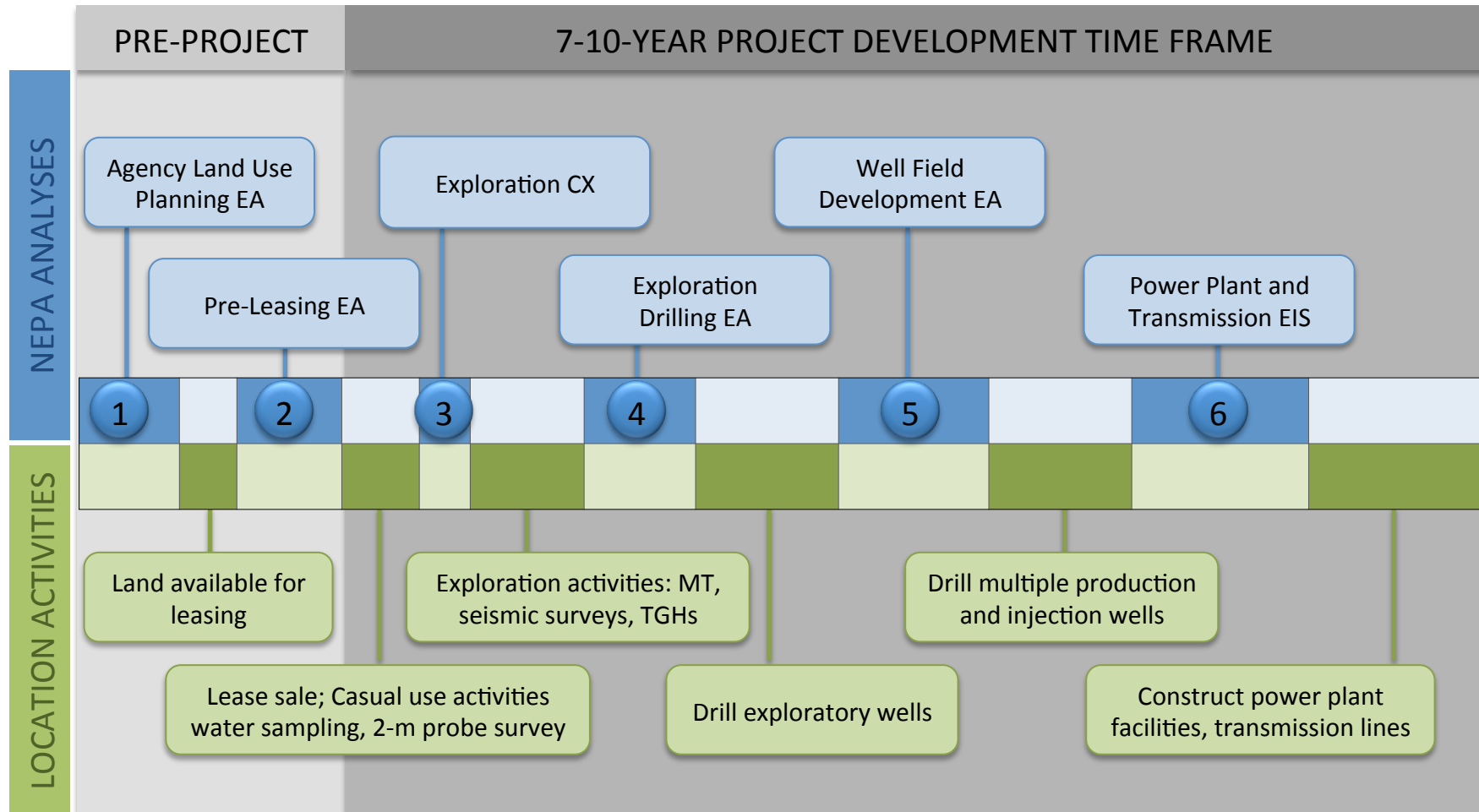
NEPA Timeline  
Reduction Potential



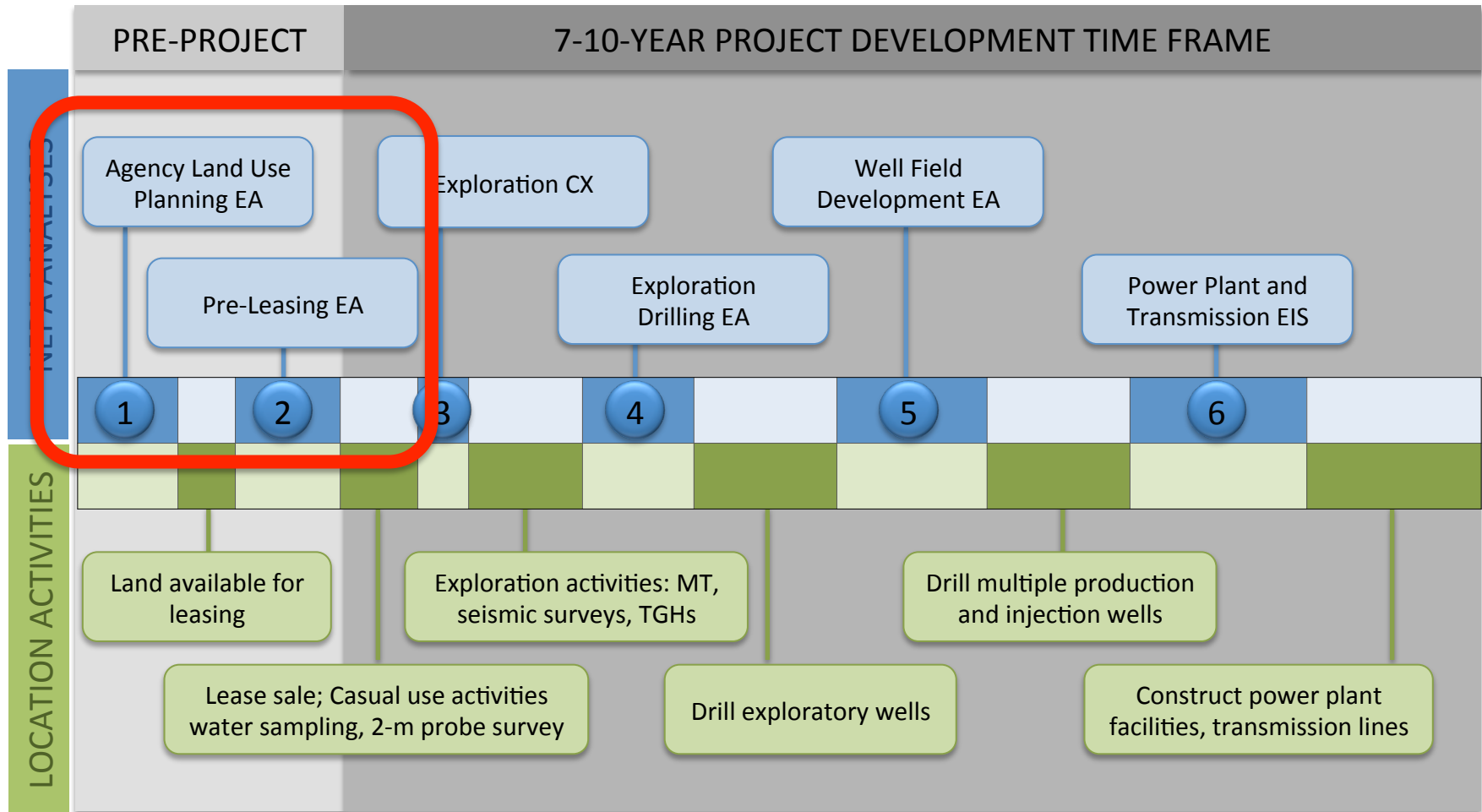
Tracking timelines and identifying applicant/agency delays will increase transparency and provide data for increased accountability.

## POTENTIAL IMPROVEMENTS: Combining NEPA Timelines

One way to potentially reduce the cumulative NEPA timelines is to combine two of the six NEPA analyses in the timeline below into one NEPA analysis.



## POTENTIAL IMPROVEMENTS: Combining NEPA Timelines: #1 and #2



## POTENTIAL IMPROVEMENTS: Combining NEPA Timelines: #1 and #2

### Example: Geothermal Leases – Post 2008 Programmatic Geothermal EIS<sup>1</sup>

- Recent policy changes provide a glimpse of the BLM’s ability to help facilitate the goal of lowering the NEPA permitting timelines.
- The 2008 PGEIS cleared 78% of geothermal parcels for lease using a DNA, eliminating the need to conduct 295 EAs and effectively reducing the overall project timelines.
- Expanding on this policy idea:
  - a programmatic EIS could be conducted for exploration drilling, or
  - individual field offices could conduct pre-lease EAs for exploration drilling.
- Either option would further streamline the permitting process during the critical high-risk, low-financing-option early phases of geothermal development.

State	Leases Offered	Additional Documents	
		DNA	EA
CA	15	12	3
CO	3	1	2
ID	12	12	0
NV	267	246	21
OR	11	11	0
UT	68	13	55
<b>Totals</b>	<b>376</b>	<b>295</b>	<b>81</b>

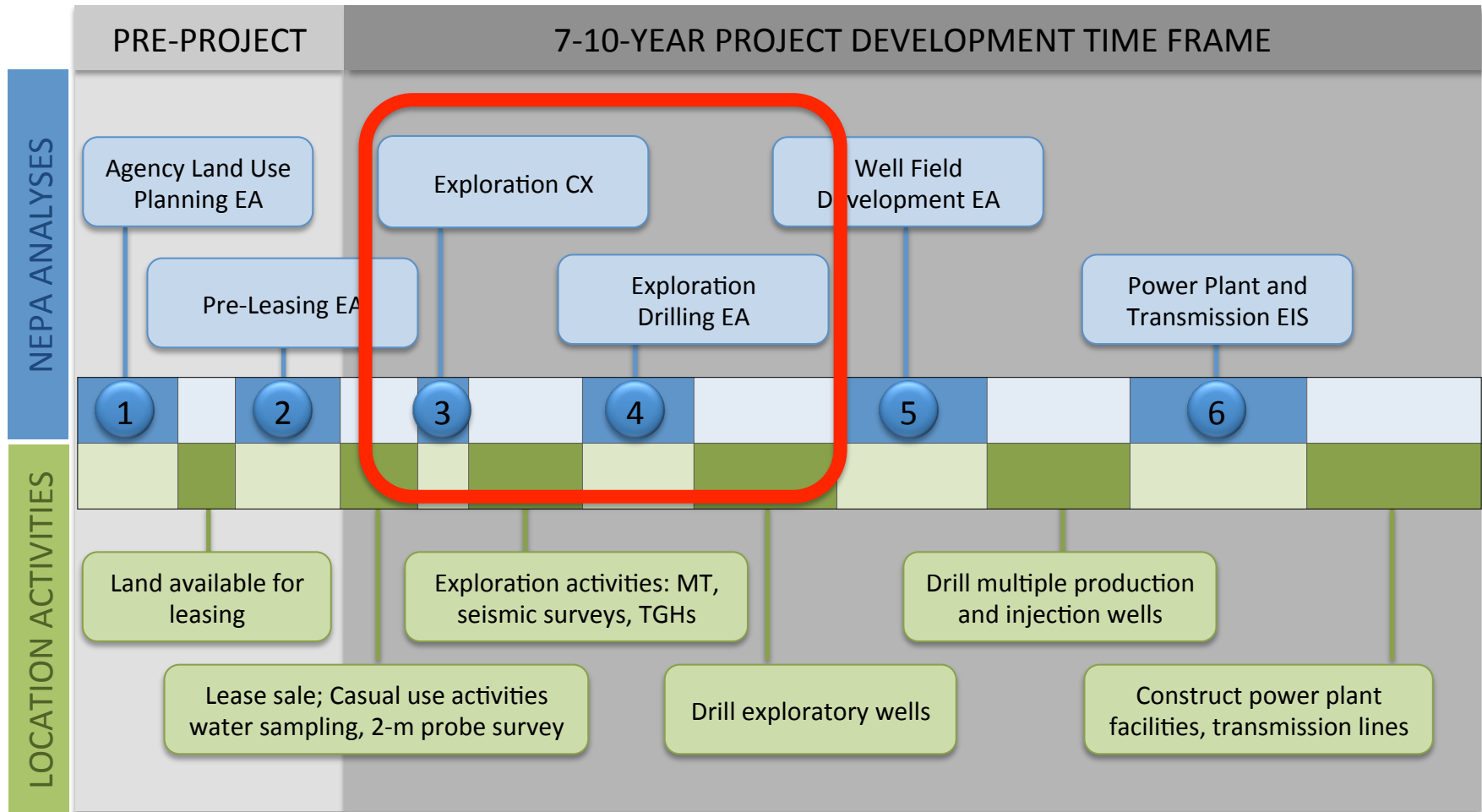
1 – Sales through 11/19/2013  
Data source: LR2000; BLM Geothermal Lease Sale Results.



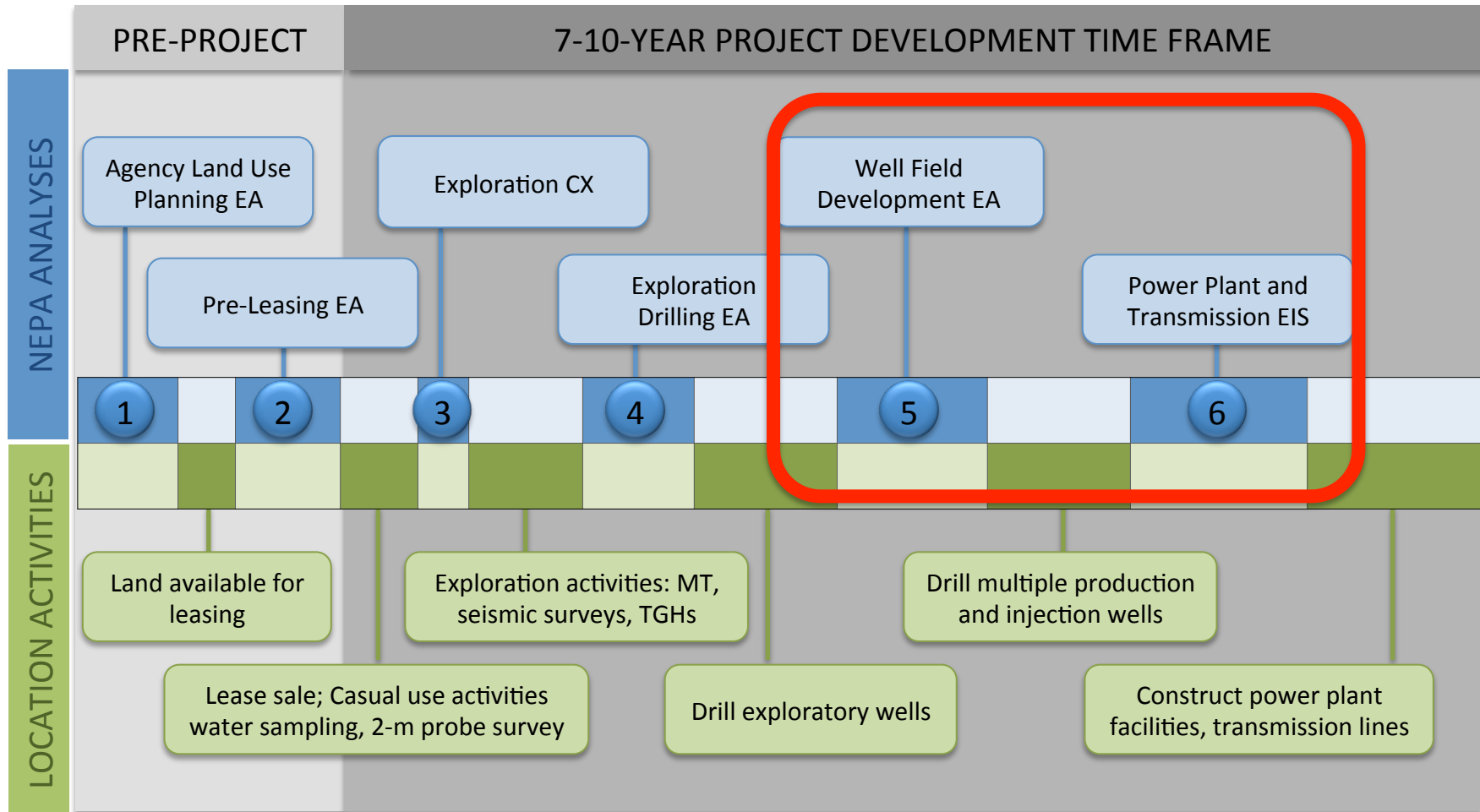
Implementing agency policy changes can help facilitate the goal of lowering the NEPA permitting timelines.



## POTENTIAL IMPROVEMENTS: Combining NEPA Timelines: #3 and #4



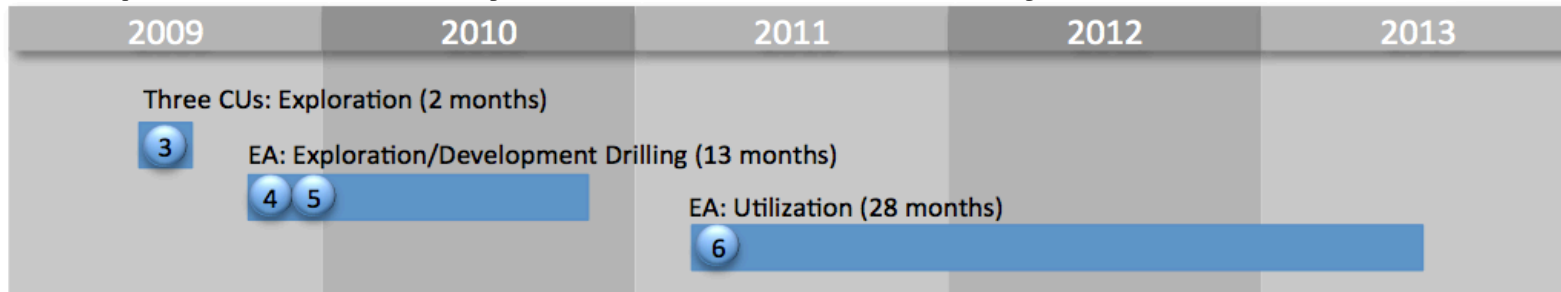
## POTENTIAL IMPROVEMENTS: Combining NEPA Timelines: #5 and #6



**POTENTIAL IMPROVEMENTS: Combining NEPA Timelines: #3 and #4**

This may be particularly useful if the exploration (e.g. slim holes, TGHs) are cannot be permitted with a CX (e.g. if they have greater surface disturbance than the limit, or if they meet criteria on an agency’s extraordinary circumstances list).

**Example: New York Canyon Geothermal Power Project NEPA Timelines**

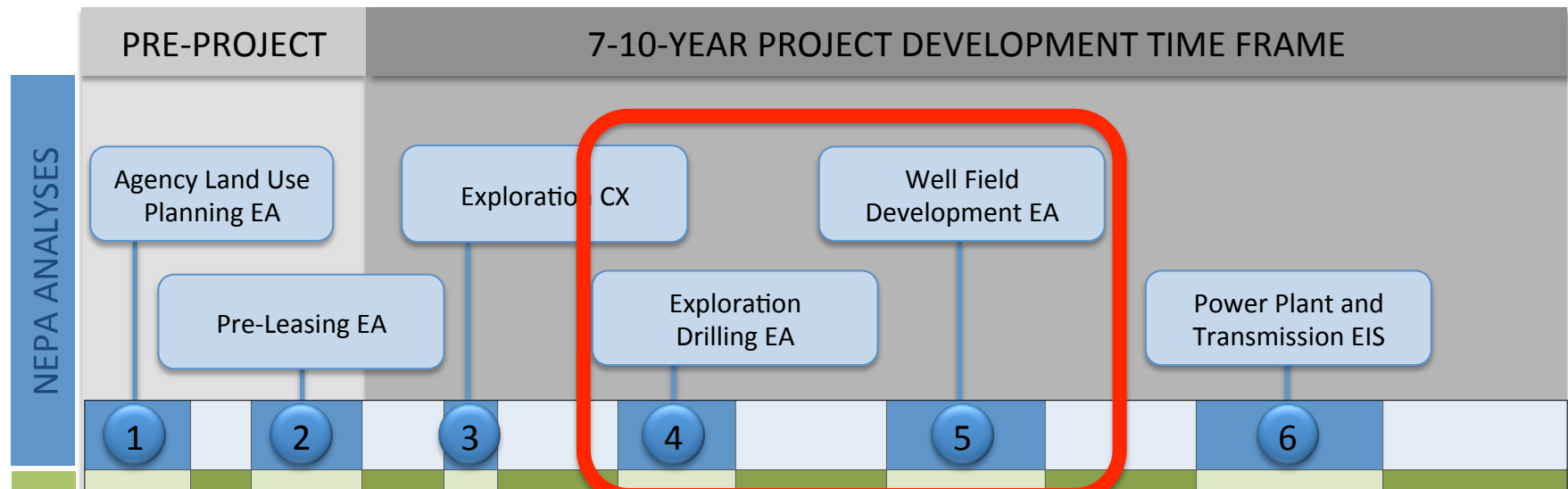


- Completed permitting for the entire project in about four years.
- Project included:
  - three NOIs for geophysical exploration – considered casual use
  - EA for NOIs for TGH and GDPs for exploration development drilling.
  - EA to approve a POU for reservoir development and construction of a power plant and transmission lines.



Combining environmental analyses (e.g. for exploration and development drilling) to reduce the number of times a NEPA analysis is conducted.

## POTENTIAL IMPROVEMENTS: Combining NEPA Timelines: #4 and #5



- Submitting comprehensive POOs or PODs that may only require one EA instead of two or more.
- The possibility exists for:
  1. Potentially longer up-front analysis, delaying initial exploration efforts
  2. Potentially unnecessary expenditures on analyses for prospective GDPs that are never used due to negative exploration results.

These time and cost expenditures could be more than offset by the time saved in projects that do indicate positive exploration results.

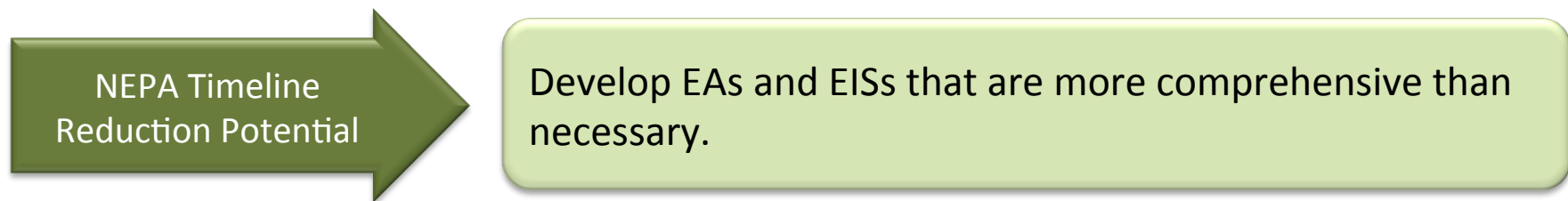
**POTENTIAL IMPROVEMENTS: Comprehensive POOs/PODs**

Geothermal Area	NEPA Tiered Document Name/ Number	EA		DNA	
		Days to Approve	Date of FONSI / ROD	Application Date	Days to Approve
Salt Wells Geothermal Area	Salt Wells Geothermal Energy Projects Final Environmental Impact Statement Final DOI-BLM-NV-CC-ES-11-10-1793	749	9/30/11	12/6/11	51
				12/6/11	51
				12/31/11	27
Gabbs Valley Geothermal Area	Environmental Assessment Gabbs Valley and Dead Horse Wells Geothermal Exploration Projects - DOI-BLM-NV-C010-2010-0006-EA	363	11/13/10	5/20/11	26
				1/31/12	16
				10/11/12	14
				1/4/13	27
Dixie Meadows Geothermal Area	Dixie Meadows Geothermal Exploration Project DOI-BLM-NV-C010-2011-0516-EA	510	1/17/12	6/29/12	154
				1/11/13	34
Coyote Canyon Geothermal Area	Coyote Canyon South Exploration DOI-BLM-NV-C010-2012-0051-EA	336	12/18/12	12/18/12	21
				1/14/13	56
Tungsten Mountain Geothermal Area	Tungsten Mountain Geothermal Exploration Environmental Assessment DOI-BLM-NV-C010-0029-EA	407	3/28/12	4/2/12	14
				7/31/12	31
				8/13/12	44



## POTENTIAL IMPROVEMENTS: Comprehensive Applications

- Where a project may only require a defined number of drilling permits initially, developers that compile NEPA documents and are contemplating additional drilling permits (that may or may not be needed) have been able to obtain approval for those additional permits by tiering a DNA off the initial EA or EIS.
- This practice could also be used for utilization activities by contemplating more impacts than seemingly necessary in the POU.
- At a minimum, the data show that the median approval time for a tiered DNA was just under 30 days, whereas the median approval time for an EA was 302 days.



## CONCLUSIONS

---

Ways to reduce NEPA timeline impact on geothermal development:

### POTENTIAL AGENCY ACTIONS:

1. **Utilizing CUs, CXs, and DNAs**, which take less time than EAs and EISs, for example
  - if CXs could be expanded to used for exploration drilling (Step 4)
  - If leasing EAs could be expanded so that exploration drilling (Step 4) could be approved with DNAs rather than EAs
2. **Tracking timelines** and identifying applicant/agency delays will increase overall accountability and transparency.
  - Workflow management software has been shown to improve accountability, process timeframes, and adherence to policies.
3. **Implementing BLM policy changes** that can help facilitate the goal of lowering the NEPA permitting timelines, for example:
  - Developing a centralized permitting office (as was developed for oil and gas) to improve consistency, improve efficiency, reduce training of field office staff in multiple offices.

### CONCLUSIONS

---

Ways to reduce NEPA timeline impact on geothermal development:

#### POTENTIAL DEVELOPER ACTIONS

4. **Combining environmental analyses** for exploration and development drilling.
  - Most effective after resource has been proven (so don't spend money before resource is known to exist)
5. **Developing EAs and EISs that are more comprehensive** than necessary.
  - Most effective at well field development phase; if additional GDPs submitted after EA is complete, will be able to approve using DNAs rather than additional EAs
6. **Actively engaging with tribes and the public; and avoiding areas containing protected wildlife** (under the Endangered Species Act), when possible



*This project is funded by the Geothermal Technologies Office through Annual Operating Plan funds.*

# Thank You



Kate Young  
[katherine.young@nrel.gov](mailto:katherine.young@nrel.gov)  
(303) 384-7402

Aaron Levine  
[aaron.levine@nrel.gov](mailto:aaron.levine@nrel.gov)  
(303) 275-3855

**Acknowledgments:**

The authors wish to thank Jim Vezina, Jon Weers, Nick Langle, Debbie Brodt-Giles, and the OpenEI development team for their efforts in creating a framework for this complex data set. We are grateful to Andrew Gentile and his team at EMPSi, Kyle Snyder (Ormat), Tania Tries (Environmental Panorama), and other BLM staff who have aided in the collection of documents and data for the Geothermal NEPA Database.

NREL is a national laboratory of the U.S. Department of Energy, Office of Energy Efficiency and Renewable Energy, operated by the Alliance for Sustainable Energy, LLC.