



## The WST Review Process

Employing science-driven methods and technology, CalGEM ensures that California oil and gas operators comply with the new WST regulations before, during, and after the well stimulation through measures which include the Application and Permit process. This process includes a menu-driven series of specific data requirements provided through a standard application, along with requirement for supportive documentation, including predictive fracture modelling by a methodology approved by CalGEM. A significant element of the WST permit application approval process includes application review by multiple state agencies (called “memorandum of agreement,” or “MOA agencies”) working as unique multiagency cooperative task force dedicated to the rigorous review, monitoring, and evaluation of WSTs in California.

Lawrence Livermore National Lab (LLNL) recently provided an independent third-party technical review of the WST application and permitting process. One of the recommendations provided by LLNL was to have operators provide a description of the methodology and the supporting data for the ADSA (Axial Dimensional Stimulation Area) modeling in future applications for Well Stimulation Treatment (WST) permits. The purpose of this “ADSA narrative” is to facilitate third-party technical review of WST permits and transparency of the basis for approval of a WST permit. CalGEM has immediately implemented this recommendation into the WST workflow and have been reviewing the narrative submitted by the operators prior to issuing new permits.

The attached WST Permit Application Process chart summarizes the basic steps each application goes through prior to being issued a permit. These steps are mostly iterative, and are as follows:

The operator first submits the WST permit application and supporting documents via upload to CalGEM's WellSTAR system (Prior to WellSTAR this and the final permit notification was done through an email Dropbox).

WST Unit support staff assigns the application review to a CalGEM WST Unit engineer, who is notified of the assignment through WellSTAR. Upon preliminary evaluation by CalGEM, if the submittal package is deemed incomplete, CalGEM contacts the

operator and requests the missing information, documentation, or attachments; if the submittal package is complete, it is then ready for a Division Engineer to conduct a rigorous engineering review. At this time, CalGEM's CEQA unit and MOA agencies are notified by an automated WellSTAR function, that the new application is available for download and to review in WellSTAR. This set off the required 45-day MOA review and comment period.

The Division WST Permit Engineer, and MOA agencies then review and validate the WST application data and attachments in an iterative fashion. The ADSA regulatory review is conducted solely by CalGEM and the State Water Boards. During the review period all MOA agencies may communicate directly with operator representatives to collect required information. Final MOA agency comments are submitted to CalGEM via email by the end of the 45-day comment period.

As part of WST review, the permit engineer conducts a risk analysis of the area surrounding the stimulation well by reviewing the wells within the two times of the proposed ADSA. More detail information pertaining to 2xADSA review can be found in the 2xADSA risk assessment document. Per an LLNL recommendation, even wells that do not intersect the two times ADSA but are still within the boundary have been documented in the risk assessment spreadsheet, which will more clearly document the review for any third-party reviewer. WST engineering geologists evaluate the geologic conditions within five times the ADSA to ensure the geologic and hydrologic isolation of the oil and gas formation during and following well stimulation. More information on the steps of the 5xADSA evaluation can be found in the 5xADSA document.

Each WST application is assigned to a Division Engineer within the WST Unit who does all the following:

- Verify that the application is complete and accurate and request any missing information or analysis from the applicant;
- Review the applications to ensure that it complies with all standards and requirements in regulation;
- Work with CalGEM's CEQA Unit to ensure compliance with the California Environmental Quality Act,; and

- Work with MOA agencies to address any comments or concerns raised during the MOA comment period.

Once all of that is complete, the Division Engineer will generate a Draft WST Permit for the WST Unit Supervisor to review and approve. Following the WST Unit supervisor approval, the WST permit goes to the CalGEM's State Oil and Gas Supervisor for final approval and signature. The permit is then posted on WellSTAR along with notification of availability on WellSTAR to all required parties, including the operator, MOA agencies, and the local Planning Commission. CEQA is also notified and obtains a State Clearinghouse number for the WST within 5 days from the date the permit is issued.

Each WST Permit is valid for one year from the date of issue, after which time the permit will expire.