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DOI\USGS 1755-1780 (Rev. 2) (Sufficient)

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Serial Number	System Name	Center Lower Frequency (MHz)	Upper Frequency (MHz)	Emission Bandwidth (MHz)	Receiver Bandwidth (MHz)	System Use Type Name	Operation Area	Transmitter State	Transmitter Latitude	Transmitter Longitude	Receiver State	Receiver Latitude	Receiver Longitude	Frequency Remarks	Geographic Location associated with Timeline (AAO in this column indicates the timeline is associated with the geographic location defined by the Authorized Area of Operation in the frequency	Sharing Type (Indefinite, Temporary i.e. Coordinated, or None)	Temporary Sharing Timeline (Months After 1/31/2015)	Indefinite Sharing Timeline (Months After 1/31/2015)	Vacate Assignment Timeline (Months After 1/31/2015)
I076513	EHZ SEIS	1779		5	8	Microwave	Microwave Link	CA	382054N	1223441W	CA	375527N	1223548W	8 GHz	Sonoma Mtn, CA to Mt Tamalpais, CA	None			36
I076515	EHZ SEIS	1763		5	8	Microwave	Microwave Link	CA	375527N	1223548W	CA	375302N	1221322W	8 GHz	Mt Tamalpais, CA to Vollmer Pk, CA	None			36
I076521	EHZ SEIS	1763		5	8	Microwave	Microwave Link	CA	370649N	1215010W	CA	372720N	1221022W	8 GHz	Crystal Pk, CA to Menlo Park, CA	None			36
I076523	EHZ SEIS	1779		5	8	Microwave	Microwave Link	CA	364537N	1212928W	CA	370649N	1215010W	8 GHz	Fremont Pk, CA to Crystal Pk, CA	None			36
I076525	EHZ SEIS	1760		5	8	Microwave	Microwave Link	CA	355700N	1205957W	CA	364537N	1212928W	8 GHz	Williams Hill, CA to Fremont Peak, CA	None			36
I076594	EHZ SEIS	1760		5	8	Microwave	Microwave Link	CA	384552N	1225042W	CA	382054N	1223441W	8 GHz	Geyser Peak, CA to Sonoma Mtn, CA	None			36
I096507	EHZ SEIS	1779		5	8	Microwave	Microwave Link	CA	355207N	1202852W	CA	355700N	1205957W	8 GHz	Hog Canyon, CA to Williams Hill, CA	None			36
I096509	EHZ SEIS	1763		5	8	Microwave	Microwave Link	CA	352337N	1202100W	NE	355207N	1202852W	8 GHz	Black Mtn, CA to Hog Canyon, CA	None			36
I096511	EHZ SEIS	1760		5	8	Microwave	Microwave Link	CA	334743N	1173633W	CA	340810N	1180739W	8 GHz	Pleasants Pk,CA to Pasadena, CA	None			36
I096515	EHZ SEIS	1760		5	8	Microwave	Microwave Link	CA	345257N	1175927W	CA	344415N	1173339W	8 GHz	Edwards AFB,CA to Shadow Mtn, CA	None			36
I106500	EHZ SEIS	1779		5	8	Microwave	Microwave Link	CA	344415N	1173339W	CA	341357N	1171405W	8 GHz	Shadow Mtn,CA to Strawberry Peak, CA	None			36
I116598	EHZ SEIS	1779		5	8	Microwave	Microwave Link	CA	340810N	1180739W	CA	334743N	1173633W	8 GHz	Pasadena,CA to Pleasants Pk, CA	None			36

System Name	Total Pre-Auction Cost ($M)	Funds Requested Prior to Auction ($M)	Transition Implementation Cost ($M)	Total Cost ($M)	Begin Expenditure Timeline (Months after Receipt of Funds)	End Expenditure Timeline (Months after Receipt of Funds)	Expanded Capability Cost ($M)	Expanded Capability Description	Expanded Capability Justification
EHZ SEIS	0.0000	0.0000	28.6680	28.6680	1	120			
USGS Spectrum Relocation Program Office	0.0000	0.0000	7.0120	7.0120	1	120			
Total	0.0000	0.0000	35.6800	35.6800			0.0000		

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Interaction Name	Interaction Description
1.	Alternate frequency assignments will be needed for all eligible assignments listed herein (and their paired duplex channels)
2.	Alternate frequency assignments may need Tx power waivers to reach needed system reliability. (mid 2014)
3.	Alternate frequency assignments will be needed for additional stations as described in Tab I and for frequency diversity to reach needed system reliability.
4.	Temporary assignments will be needed in the 1780-1850 MHz Band for sites that are selected for fast track implementation. (2015)

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Factor Name	Factor Description
1. Jurisdictional approval of new towers and radio sites	Approval processes for construction, leases, permits and other requirements often have indeterminate timeframes when can lead to schedule delays.
2. Inability to obtain temporary frequencies in the 1780 - 1850 MHz band	Unable to "Fast Track" vacating the 1755-1780 MHz making that spectrum available while the USGS transitions to the 8GHz band.

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Note Name	Note Text
1. Exectuve Summary	As part of the FCC spectrum auction in the fall of 2014, the USGS Seismic Network in California will be required to vacate 12 Radio Frequency Authorizations used in microwave point to point radio links. These radio links are used 24x7x365 to collect real-time life and safety information from hundreds of earthquake sensors in California and the west coast. This network serves the emergency response community, national, state, and local governments, and the public by providing critical real-time information on earthquake locations and magnitudes, ShakeMaps, shaking performance of engineered structures, and data for the California Earthquake Early Warning System. Reliability, security, low maintenance costs, data integrity and environmental/hazard/earthquake resiliency are mission critical requirements of this system. Complete studies on the impact of transitioning to other frequency bands have not been completed, and no funding or time is available to do so before the required submission of this Transition Plan. Cost estimates will be refined after additional engineering studies are completed upon preauction funding transfer.
2. Notes for Tab C, D & E	The attached Transition Plan assumes that the affected links will be relocated to the 8GHz Band to avoid moving to other planned auction frequency bands, although alternative compatible technical/cost/schedule solutions may be employed as technology allows. As the system is transitioned, additional links will be required, additional equipment will be required, and the potential for interference at 8 GHz is possible. Incremental improvements to the current system design may be undertaken to insure industry standard microwave reliability, security, data integrity and resiliency with low out-year maintenance costs. Regulatory requirements (permits and modifications to current regulation) will be addressed. IT and data management systems will be modified to accommodate changes to the system.
3. Fast Track Option	The USGS could vacate the affected frequencies more quickly ("Fast Track") than planned under the transition to 8GHz by replacing frequency pairs scheduled for auction with temporary frequency pairs in the 1780-1850 MHz band. This would require NTIA to assign new temporary RFAs in this band, re-crystal existing radios, and site visits to each of the impacted microwave sites. Costs for a "Fast Track" approach are not included in this plan due to significant cost increase with moderate schedule acceleration.
4. Paired Assignments	An additional 18 frequency links listed below in the upper band (1780-1850 MHz) must also be transitioned to relocate the entire system. These links, together with those in the 1755-1780 band, comprise a single communications system transporting earthquake data. A single system that operated duplex links in both the 1755-1780 and 8GHz bandwidth with different hardware and software would be exceedingly complicated to operate and likely compromise the integrity of the system.

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Note Name	Note Text
5. Paired Serial Numbers	[Serial #/System Name/Location/Paired Serial #/Frequency (MHz)] I 096515/EHZ SEIS/Edwards AFB,CA to Shadow Mtn, CA/I 096514/1815 I 096511/EHZ SEIS/Pleasants Pk,CA to Pasadena, CA/I 096510/1815 I 106500/EHZ SEIS/Shadow Mtn,CA to Strawberry Peak, CA/I 106501/1830 I 116598/EHZ SEIS/Pasadena,CA to Pleasants Pk, CA/I 116599/1830 I 076525/EHZ SEIS/Williams Hill, CA to Fremont Peak, CA/I 076524/1810 I 076594/EHZ SEIS/Geyser Peak, CA to Sonoma Mtn, CA/I 076512/1810 I 076515/EHZ SEIS/Mt Tamalpais, CA to Vollmer Pk, CA/I 076516/1815 I 076521/EHZ SEIS/Crystal Pk, CA to Menlo Park, CA/I 076520/1815 I 096509/EHZ SEIS/Black Mtn, CA to Hog Canyon, CA/I 096508/1815 I 076513/EHZ SEIS/Sonoma Mtn, CA to Mt Tamalpais, CA/I 076514/1830 I 076523/EHZ SEIS/Fremont Pk, CA to Crystal Pk, CA/I 076522/1830 I 096507/EHZ SEIS/Hog Canyon, CA to Williams Hill, CA/I 096506/1830 I 076518/EHZ SEIS/Vollmer Pk to Menlo Park,CA/I 076519/1794 I 076519/EHZ SEIS/Menlo Park to Vollmer Pk,CA/I 076518/1847 I 096512/EHZ SEIS/Pleasants Pk to Strawberry Pk, CA/I 096513/1794 I 096513/EHZ SEIS/Strawberry Pk to Pleasants Pk, CA/I 096512/1847 I 106601/EHZ SEIS/Williams Hill to Fremont Pk, CA/I 106602/1847 I 106602/EHZ SEIS/Fremont Pk to Williams Hill, CA/I 106601/1810
6. Notes on Bandwidth specifications (Tab C)	1. Emission Bandwidth (col D) is derived from the emission designator: 5M00G7W (128 TCM digital modulation). 2. Rx IF Bandwidth (col E) is estimated from 8dB adjacent channel rejection specification.
Request for extension for expenditure of funds	Request for extension of a total of 84 months for expenditure of funds, funding was allocated to the stakeholder in late FY15 as a result, stakeholder is unable to complete the planned work in the current allotted time. The additional time will provide for the awarding of the tower construction contract and solicitation for the replacement radios and services to install.
USGS request for extension for expenditure of funds	USGS is extending the expenditure of funds from 09/2021 to 09/2025. This extension enables USGS to migrate operation from decommission locations and secure permits to complete construction of key towers at several locations. The work has been delayed due to COVID 19 restrictions.

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Table	Row	Column	CUI Category	Safeguarding and/or Dissemination Authority