### WITS\_WITSML Record 7 MWD & Gyro Survey Record Variable Mapping

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| **WITS Record ID:** 07 | **Logical Record Type:** 157 | **Auto/Manual:** Automatic |
| **Trigger:** [EVENT] Transmit when new survey data values are received and computed (MWD) or when manually triggered by operator | | |
| **Data Source:** Data acquired in real-time by MWD, Gyro, RSS or Directional tools or entered manually from other sources. | | |
| **Data Typology:** Reference (Ref), Date\_Time\_Stamp(Dts), Real-time-Measure (Rtm), Real-time-Signal (Rts), Limit (Lim), Set-Point (Spt), Calculation (Cal), Distribution (Dis), Command (Com), Parameter (Par), Synthetic Value (Syn), Alarm (Alm), Interpreted (Int), Modeled (Mod), Observed (Obs), Code (Cod), Count (Cnt), Cumulative (Cml), Status (Sta), Expected (Exp), Estimated (Est), Serial Number (Ser), Downhole Measurement (Dhm) | | |
| **Data Field Types:** A = Alphanumeric String, L = 32 bit 2's complement signed integer, S = 16 bit 2's complement signed integer, F = 32 bit IEEE single precision floating point, E = Engineering, B = Boolean (1 if True and 0 if False), D = Date, T = Time, V = Variant, IL = Integer List, FL = Float List, EL = Engineering List, TL = Text List | | |
| **Reserved Characters:** Comma (,) - Separates Fields, Semi Colon (;) - Separates Items in a Standard Record, Colon (:) - Separates items in Date and Time Fields, Ampersand (&) - Separates items in a List | | |
| **Data Mnemonic Abbreviations:** Raw (Raw), Average (Avg), Max (Max), Min (Min), Mean (Men), Root-Mean-Square (Rms), Percent (Pct), Error (Err), Correlation (Cor), Probability (Prob), Variance (Var), Spread (Spd), Mean-Absolute-Deviation (Mad), Ratio (Rat), Standard Deviation (Std), Mode (Mod), Weighted Mean (Wtm), Dispersion (Dis), Product (Pro), Sum (Sum), Cumulative Sum (Csm), Corrected (Cor), Adjusted (Adj), Instantaneous (Ins), State (Sta), Observed (Obs), Expected (Exp), Observed-Cumulative (ObC), Expected-Cumulative (ExC), Total (Tot), Reported (Rep), Interpolated (Itp), Period (Per), Currency (Cur) | | |

| WITS  Record / Item | Description | STD WITS Long Mnemonic | Operator Mnemonic for WITSML & OSIsoft PI & ODA | Field Type | Length | Typology | Transmit Units (FPS) | Transmit Units (Metric) | Data System  Type |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 0701 | Unique Primay Well Identification | WELLID | WELLID | A | 16 | Ref | ~~~ | ~~~ | Unique Well ID |
| 0702 | Unique Primary Wellbore ID (Stk/By-Pass/Interval) | STKNUM | WELLBOREID | S | 2 | Ref | ~~~ | ~~~ | Unique Wellbore ID |
| 0703 | Record Identifier | SVYRECID | SVYRECID | L | 4 | Ref | ~~~ | ~~~ | Identification |
| 0704 | Sequence Identifier | SVYSEQID | SVYSEQID | L | 4 | Ref | ~~~ | ~~~ | Identification |
| 0705 | Date (Month-Day-Year) | SVYDATE | SVYDATE | A | 16 | Dts | ~~~ | ~~~ | Date |
| 0706 | Time (HH:MM:SS) | SVYTIME | SVYTIME | S | 2 | Dts | ~~~ | ~~~ | Time |
| 0707 | Activity Code | ACTC | WITSSTAT | S | 2 | Cod | ~~~ | ~~~ | Activity |
| 0708 | Survey Measured Depth Observed (Uncorrected) | DSVM | SVYMD | L | 4 | Obs | F | M | Depth |
| 0709 | Survey True Vertical Depth (Uncorrected) | DSVV | SVYTVD | L | 4 | Cal | F | M | Depth |
| 0710 | Survey Pass (1) and Fail (0) | PASS | SVYPASS | L | 4 | Cod | ~~~ | ~~~ | Valid |
| 0711 | Depth Hole (Measured) | DMEA | DEPTH | S | 2 | Obs | F | M | Depth |
| 0712 | Survey Type (0-Magnetic., 1-Gyro, 2-Proj., 3-IncOnly) | STYP | SVYTYPE | F | 4 | Cod | ~~~ | ~~~ | Type |
| 0713 | Inclination (Calculated & Uncorrected Raw) | SINC | SVYINCU | F | 4 | Cal | DEG | DEG | Calculation |
| 0714 | Raw Survey Azimuth (Calculated & Uncorrected Raw) | SAZU | SVYAZU | S | 2 | Cal | DEG | DEG | Calculation |
| 0715 | Raw Azimuth (Calculated & Corrected Raw) | SAZC | SVYAZC | F | 4 | Cal | DEG | DEG | Calculation |
| 0716 | Survey Magnetic Toolface | SVYMTF | SVYMAGTF | A | 8 | Cal | DEG | DEG | Calculation |
| 0717 | Survey Gravity or Highside Toolface | SVYGTF | SVYGRTF | F | 4 | Cal | DEG | DEG | Calculation |
| 0718 | Svy North-South Position (+N/-S) | SVYNS | SVYNS | F | 4 | Cal | F | M | Calculation |
| 0719 | Svy East-West Position (+E/-W) | SVYEW | SVYEW | F | 4 | Cal | F | M | Calculation |
| 0720 | Survey Dog Leg Severity (Calculated) | SDLS | SVYDLS | F | 4 | Cal | DEG/100FT | DEG/30M | Calculation |
| 0721 | Survey Rate of Walk (Calculated) | SVYWALK | SVYWALK | F | 4 | Cal | DEG/100FT | DEG/30M | Calculation |
| 0722 | Survey Turn Rate (Calculated) | SVYTURN | SVYTURN | F | 4 | Cal | DEG/100FT | DEG/30M | Calculation |
| 0723 | Reference Magnetic Field Intensity | RBTOTAL | REFBTOTAL | F | 4 | Mod | nT | nT | Reference |
| 0724 | Reference Magnetic Dip Angle | RMAGDIP | REFMAGDIP | F | 4 | Mod | DEG | DEG | Reference |
| 0725 | Reference Gravitational Field Intensity | RGTOTAL | REFGTOTAL | F | 4 | Mod | milliG | milliG | Reference |
| 0726 | Magnetic Field Intensity Self-check (Raw Calculated) | MBTOTAL | MWD\_B-Total | F | 4 | Cal | nT | nT | Calculation |
| 0727 | Gravity Field Intensity Self-check (Raw Calculated) | MGTOTAL | MWD\_G-Total | F | 4 | Cal | milliG | milliG | Calculation |
| 0728 | Magnetic Dip Angle Self-check (Raw Calculated) | MMAGDIP | MMAGDIP | F | 4 | Cal | DEG | DEG | Calculation |
| 0729 | Magnetic Declination Applied | DECL | DECL | F | 4 | Ref | DEG | DEG | Reference |
| 0730 | Grid Convergence Applied | GRIDCONV | GRIDCONV | F | 4 | Ref | DEG | DEG | Reference |
| 0731 | Magnetic Reference (0=BGGM, 1=HRGM, 2=IGRF, 3=WMM, 4=EMS, 5=IFR1, 6=IFR2, 7=Other) | MAGREF | MAGREFMODEL | F | 4 | Cod | ~~~ | ~~~ | Reference |
| 0732 | Survey Sub-Type Code (0=Raw, 1=Corrected,2=Misrun, 3=Checkshot, 4=Roll Check, 5=Rotation Shot, 6=Benchmark, etc.) | SSUBTYPE | SVYSUBTYPE | F | 4 | Cod | ~~~ | ~~~ | Reference |
| 0733 | Azimuth North Reference (True=0 & Grid =1) | NREF | AZNREF | F | 4 | Cod | ~~~ | ~~~ | Reference |
| 0734 | Survey toolface limits (Calculated) | TFACEL | SVYTFACEL | F | 4 | Lim | ~~~ | ~~~ | Reference |
| 0735 | Zero Measured Depth Elevation from VRD (MSL or LAT) | REFZMDE | REFZMDE | S | 2 | Ref | ~~~ | ~~~ | Reference |
| 0736 | ISCWSA Operator's Wellbore Survey Group Formatted Tool Code Short Name | TOOLCODE | TOOLCODE | S | 2 | Cod | ~~~ | ~~~ | Reference |
| 0737 | Magnetic Sensor Package Serial Number | MSERNUM | MAGSERNUM | S | 2 | Ser | ~~~ | ~~~ | Reference |
| 0738 | Drilling Gyro Sensor Serial Number | GYSERNUM | GYSERNUM | F | 4 | Ser | ~~~ | ~~~ | Reference |
| 0739 | MWD Telemetry (0-MudPulse, 1\_Emag, 2-Wireline, 3-WiredPipe, 4-Acoustic,5-Memory, 6-Other) | TELE | TELE | F | 4 | Cod | ~~~ | ~~~ | Reference |
| 0740 | BHA Number | BHANUM | BHANUM | A | 16 | Ref | ~~~ | ~~~ | Reference |
| 0741 | Accelerometer X (MWD Accepted Directional Survey) | AX | AxMWDADS | A | 16 | Dhm | milliG | milliG | Measurement |
| 0742 | Accelerometer Y (MWD Accepted Directional Survey) | AY | AyMWDADS | A | 16 | Dhm | milliG | milliG | Measurement |
| 0743 | Accelerometer Z (MWD Accepted Directional Survey) | AZ | AzMWDADS | S | 2 | Dhm | milliG | milliG | Measurement |
| 0744 | Magnetometer X (MWD Accepted Directional Survey) | BX | BxMWDADS | A | 16 | Dhm | nT | nT | Measurement |
| 0745 | Magnetometer Y (MWD Accepted Directional Survey) | BY | ByMWDADS | F | 4 | Dhm | nT | nT | Measurement |
| 0746 | Magnetometer Z (MWD Accepted Directional Survey) | BZ | BzMWDADS | F | 4 | Dhm | nT | nT | Measurement |
| 0747 | MWD Temperature Sensor Reading (MWD Accepted Directional Survey) | MWDTEMP | MWDTEMP | F | 4 | Dhm | DEG | DEG | Measurement |
| 0748 | Drilling Gyro Inclination | DrlgGyro\_Inc | GYINCL | F | 4 | Cal | DEG | DEG | Gyroscope |
| 0749 | Drilling Gyro Azimuth | DrlgGyro\_Azim | GYAZIM | F | 4 | Cal | DEG | DEG | Gyroscope |
| 0750 | Drilling Gyro Delta Earthrate Horizontal Self-check | DrlgGyro\_DeltaERate\_Horiz | DELERH | F | 4 | Cal | DEG\_PER\_HR | DEG\_PER\_HR | Gyroscope |
| 0751 | Drilling Gyro Gravity Field Intensity Self-check | DrlgGyro\_Gtotal | GATOTAL | F | 4 | Cal | milliG | milliG | Gyroscope |
| 0752 | Drilling Survey Gyro Toolface | Svy\_Gyro\_Tface | GYTF | F | 4 | Cal | DEG | DEG | Gyroscope |
| 0753 | Drilling Gyro MWD Temperature Sensor Reading | DrlgGyro\_TEMP | GYTEMP | F | 4 | Dhm | degC | degF | Gyroscope |
| 0754 | Reference Magnetic Field Strength X axis | RMagSi-X | RMFVXAXIS | F | 4 | Mod | nT | nT | Reference Magnetics |
| 0755 | Reference Magnetic Field Strength Y axis | RMagSi-Y | RMFVYAXIS | F | 4 | Mod | nT | nT | Reference Magnetics |
| 0756 | Reference Magnetic Field Strength Z axis | RMagSi-Z | RMFVZAXIS | F | 4 | Mod | nT | nT | Reference Gravity |
| 0757 | Reference Acceleration X axis | Reg\_Accel\_X | RGFVXAXIS | F | 4 | Mod | milliG | milliG | Reference Gravity |
| 0758 | Reference Acceleration Y axis | Ref\_Accel\_Y | RGFVYAXIS | F | 4 | Mod | milliG | milliG | Reference Gravity |
| 0759 | Reference Acceleration Z axis | Ref\_Accel\_Z | RGFVZAXIS | F | 4 | Mod | milliG | milliG | Reference Gravity |
| 0760 | MWD\_First\_Lead\_Engineer\_Name | MWD\_1st\_Engr | 1STMWDHAND | F | 4 | Ref | ~~~ | ~~~ | Personnel |
| 0761 | MWD\_Second\_Lead\_Engineer\_Name | MWD\_2nd\_Engr | 2NDMWDHAND | F | 4 | Ref | ~~~ | ~~~ | Personnel |
| 0762 | 3rd\_Party\_Correction\_Svcs\_Provider | 3rd\_Party\_Corrections\_Svs | 3RDPTYCORRPROV | F | 4 | Ref | ~~~ | ~~~ | Personnel |
| 0763 | Gyro\_Lead\_Engineer\_Name | DrlgGyro\_MWD-Engr | GMWDHAND | F | 4 | Ref | ~~~ | ~~~ | Personnel |
| 0764 | MWD\_GryoMWD\_Company | DrlgGyro\_Svcs\_Company | GMWDSVCPROV | A | 16 | Ref | ~~~ | ~~~ | Personnel |
| 0765 | Directional\_Drlg\_Svcs\_Provider | DirDrlg\_Company | DDSVCPROV | A | 16 | Ref | ~~~ | ~~~ | Personnel |
| 0766 | First Lead Directional Driller (Days) | DirDrlg\_1st\_Lead | 1STDIRDRILLER | A | 16 | Ref | ~~~ | ~~~ | Personnel |
| 0767 | Second Lead Directional Drilling (Nights) | DirDrlg\_2nd\_Lead | 2NDDIRDRILLER | A | 16 | Ref | ~~~ | ~~~ | Personnel |
| 0768 | True Along Hole Depth (Calibrated & Stretch Corrected) | 3rdPtyCor\_Svy\_TAHD | 3PTYSVYTAHDC | A | 16 | Cal | F | M | 3rd Party Corrected |
| 0769 | Primary Depth Svy/reading (Measured depth of Survey, Not Stretch Corrected) | 3rdPtyCor\_Svy\_MD | 3PTYSVYMD | A | 16 | Cal | F | M | 3rd Party Corrected |
| 0770 | Primary Latest Approved Survey Inclination, No Sag Correction | 3rdPtyCor\_Svy\_Inc | 3PTYSVYINC | A | 16 | Cal | DEG | DEG | 3rd Party Corrected |
| 0771 | Svy Inclination (Sag Corrected) | 3rdPtyCor\_Svy\_Inc\_SAG | 3PTYSVYINCSAGC | A | 16 | Cal | DEG | DEG | 3rd Party Corrected |
| 0772 | Primary Latest Approved Azimuth (Corrected) | 3rdPtyCor\_Svy\_Azimuth | 3PTYSVYAZIMC | F | 4 | Cal | DEG | DEG | 3rd Party Corrected |
| 0773 | Svy Type (0-MWD, 1-Gyro, 2-Projection) | 3rdPtyCor\_Svy\_Type | 3PTYSVYTYPE | F | 4 | Cod | ~~~ | ~~~ | 3rd Party Corrected |
| 0774 | Depth Svy/reading (vert or TVD) | 3rdPtyCor\_Svy\_TVD | 3PTYSVYTVDC | F | 4 | Cal | F | M | 3rd Party Corrected |
| 0775 | Varying Curvature (%) | Var\_Curv | VCURVEQC | F | 4 | Cal | % | % | Curvature Metrics |
| 0776 | Survey Lateral Undulation Index (Calculated) | Lat\_Undul-Indx | SLUNDINDX | F | 4 | Cal | ~~~ | ~~~ | Curvature Metrics |
| 0777 | Survey Vertical Undulation Index (Calculated) | Ver\_Undul-Incx | SVUNDINDX | S | 2 | Cal | ~~~ | ~~~ | Curvature Metrics |
| 0778 | Survey Tortuosity Index (Calculated) | Svy\_Tort\_Indx | STORTI | F | 4 | Cal | ~~~ | ~~~ | Curvature Metrics |
| 0779 | Survey Directional Difficulty Index (Calculated) | Svy\_DDI | SDDI | F | 4 | Cal | ~~~ | ~~~ | Curvature Metrics |
| 0780 | Survey Tortuosity (Calculated) | Svy\_Tort | STORT | F | 4 | Cal | DGHF | DGHM | Curvature Metrics |
| 0781 | Cumulative Dogleg Severity (Sum of 20ft Interpolated DLS) | Cuml\_DLS | CDLS20 | F | 4 | Cal | DGHF | DGHM | Curvature Metrics |
| 0782 | Cumulative Tortuosity (Sum of 20ft Interpolated DLS Change) | Cuml\_Tort | CTORT20 | F | 4 | Cal | DGHF | DGHM | Curvature Metrics |
| 0783 | Overall Cumulative Curvature | Cuml\_OCC | OCC | F | 4 | Cal | DEG | DEG | Curvature Metrics |
| 0784 | Cumulative Tortuosity (Sum of 20ft Interpolated DLS Change) per 1K Ft | Cuml\_TortP1K | CTORTP1K | F | 4 | Cal | DEG | DEG | Curvature Metrics |
| 0785 | Continuous Inclination | MWD\_CONT\_INCL | MWDCONTINC | F | 4 | Cal | DEG | DEG | Realtime Cont.Svy |
| 0786 | Continuous Azimuth | Continuous Azimuth | MWDCONTAZIM | F | 4 | Cal | DEG | DEG | Realtime Cont.Svy |
| 0787 | RSS\_Inc (Rotary Steerable) | RSS\_Inc | RSSINC | F | 4 | Cal | DEG | DEG | Realtime Cont.Svy |
| 0788 | RSS\_Azimuth (Rotary Steerable) | RSS\_Azimuth | RSSAZIM | F | 4 | Cal | DEG | DEG | Realtime Cont.Svy |
| 0789 | Motor\_Inc (Instrumented Mud Motor) | Motor\_Inc | LWDMINC | F | 4 | Cal | DEG | DEG | Realtime Cont.Svy |
| 0790 | Motor\_Azimuth (Instrumented Mud Motor) | Motor\_Azimuth | LWDMAZIM | F | 4 | Cal | DEG | DEG | Realtime Cont.Svy |
| 0791 | Near-Bit Sub Inclination | NearBitSub\_Inc | NBSINC | F | 4 | Cal | DEG | DEG | Realtime Cont.Svy |
| 0792 | Near-Bit Sub Azimuth | NearBitSub\_Azim | NBSAZIM | F | 4 | Cal | DEG | DEG | Realtime Cont.Svy |
| 0793 | Wellhead Elevation (from Mean Sea Level) | WHE | WHELEV | F | 4 | Ref | F | M | Reference |
| 0794 | Well Reference Point Elevation (Bradenhead Flange, etc) | WRPE | WRPELEV | F | 4 | Ref | F | M | Reference |
| 0795 | Water Depth from VRD to Mudline (Offshore) | WaterDepth | WDPTH | F | 4 | Ref | F | M | Reference |
| 0796 | Actual Surface Location Ground Elevation (Onshore) | AGLMSL | AGLE | F | 4 | Ref | F | M | Reference |
| 0797 | Height from Ground to the Zero Measured Depth (RKB, DFE or KBE) | ZMDE\_To\_AGL OR MSL | ZMDH | F | 4 | Ref | F | M | Reference |
| 0798 | Spare Channel 1 For Custom Data as Required | SPARE1 | SPR1 | F | 4 |  | ~~~ | ~~~ | Spare |
| 0799 | Spare Channel 2 For Custom Data as Required | SPARE2 | SPR2 | F | 4 |  | ~~~ | ~~~ | Spare |
| 7000 | 7000 Series Spare Channels For Custom Survey Data as Required (Up to 999 additional channels by making 7XXX a Survey Related Channel) | Future Use | SPAREXXXX | F | 4 |  | ~~~ | ~~~ | Spare |