



# Full wwPDB X-ray Structure Validation Report ⓘ

Feb 13, 2017 – 02:08 pm GMT

PDB ID : 5IDY  
Title : Crystal structure of an oxidoreductase from Burkholderia vietnamiensis in complex with NADP  
Authors : Seattle Structural Genomics Center for Infectious Disease (SSGCID)  
Deposited on : 2016-02-24  
Resolution : 1.85 Å(reported)

This is a Full wwPDB X-ray Structure Validation Report for a publicly released PDB entry.

We welcome your comments at [validation@mail.wwpdb.org](mailto:validation@mail.wwpdb.org)

A user guide is available at

<http://wwpdb.org/validation/2016/XrayValidationReportHelp>

with specific help available everywhere you see the ⓘ symbol.

---

The following versions of software and data (see [references ⓘ](#)) were used in the production of this report:

MolProbity : 4.02b-467  
Mogul : 1.7.2 (RC1), CSD as538be (2017)  
Xtriage (Phenix) : 1.9-1692  
EDS : trunk28620  
Percentile statistics : 20161228.v01 (using entries in the PDB archive December 28th 2016)  
Refmac : 5.8.0135  
CCP4 : 6.5.0  
Ideal geometry (proteins) : Engh & Huber (2001)  
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)  
Validation Pipeline (wwPDB-VP) : recalc28949

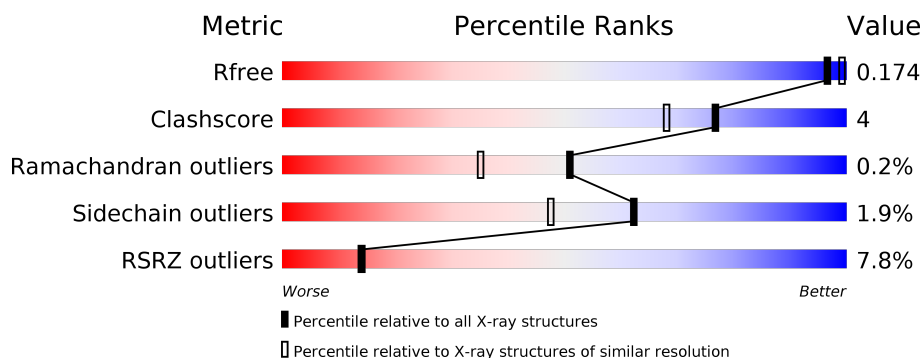
# 1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

## *X-RAY DIFFRACTION*

The reported resolution of this entry is 1.85 Å.

Percentile scores (ranging between 0-100) for global validation metrics of the entry are shown in the following graphic. The table shows the number of entries on which the scores are based.



Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
$R_{free}$	100719	1923 (1.86-1.86)
Clashscore	112137	2083 (1.86-1.86)
Ramachandran outliers	110173	2060 (1.86-1.86)
Sidechain outliers	110143	2060 (1.86-1.86)
RSRZ outliers	101464	1932 (1.86-1.86)

The table below summarises the geometric issues observed across the polymeric chains and their fit to the electron density. The red, orange, yellow and green segments on the lower bar indicate the fraction of residues that contain outliers for  $\geq 3$ , 2, 1 and 0 types of geometric quality criteria. A grey segment represents the fraction of residues that are not modelled. The numeric value for each fraction is indicated below the corresponding segment, with a dot representing fractions  $\leq 5\%$ . The upper red bar (where present) indicates the fraction of residues that have poor fit to the electron density. The numeric value is given above the bar.

Mol	Chain	Length	Quality of chain
1	A	267	<div> <div>8%</div> <div>87%</div> <div>10%</div> <div>.</div> </div>
1	B	267	<div> <div>7%</div> <div>91%</div> <div>7%</div> <div>.</div> </div>

## 2 Entry composition

There are 6 unique types of molecules in this entry. The entry contains 4553 atoms, of which 0 are hydrogens and 0 are deuteriums.

In the tables below, the ZeroOcc column contains the number of atoms modelled with zero occupancy, the AltConf column contains the number of residues with at least one atom in alternate conformation and the Trace column contains the number of residues modelled with at most 2 atoms.

- Molecule 1 is a protein called Short-chain dehydrogenase/reductase SDR.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	262	Total	C	N	O	S	0	9	0
			1928	1198	356	365	9			
1	B	264	Total	C	N	O	S	0	5	0
			1935	1200	358	368	9			

There are 16 discrepancies between the modelled and reference sequences:

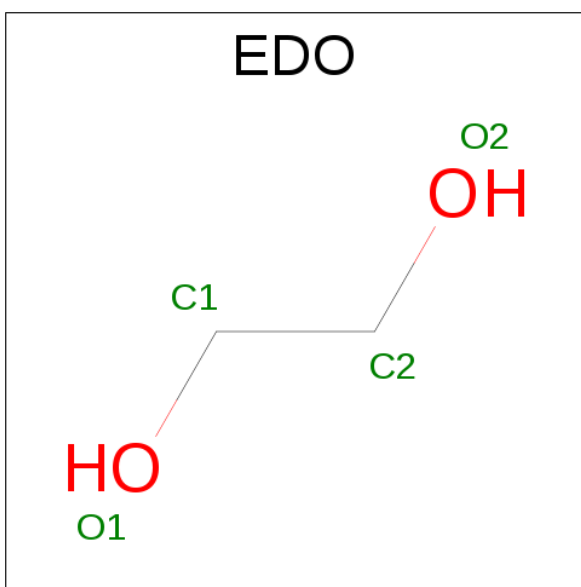
Chain	Residue	Modelled	Actual	Comment	Reference
A	-7	MET	-	initiating methionine	UNP A4JGH3
A	-6	ALA	-	expression tag	UNP A4JGH3
A	-5	HIS	-	expression tag	UNP A4JGH3
A	-4	HIS	-	expression tag	UNP A4JGH3
A	-3	HIS	-	expression tag	UNP A4JGH3
A	-2	HIS	-	expression tag	UNP A4JGH3
A	-1	HIS	-	expression tag	UNP A4JGH3
A	0	HIS	-	expression tag	UNP A4JGH3
B	-7	MET	-	initiating methionine	UNP A4JGH3
B	-6	ALA	-	expression tag	UNP A4JGH3
B	-5	HIS	-	expression tag	UNP A4JGH3
B	-4	HIS	-	expression tag	UNP A4JGH3
B	-3	HIS	-	expression tag	UNP A4JGH3
B	-2	HIS	-	expression tag	UNP A4JGH3
B	-1	HIS	-	expression tag	UNP A4JGH3
B	0	HIS	-	expression tag	UNP A4JGH3

- Molecule 2 is SULFATE ION (three-letter code: SO4) (formula: O<sub>4</sub>S).



Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
2	A	1	Total	O	S	0	0
			5	4	1		
2	A	1	Total	O	S	0	0
			5	4	1		
2	B	1	Total	O	S	0	0
			5	4	1		

- Molecule 3 is 1,2-ETHANEDIOL (three-letter code: EDO) (formula: C<sub>2</sub>H<sub>6</sub>O<sub>2</sub>).



Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
3	A	1	Total	C	O	0	0
			4	2	2		

*Continued on next page...*

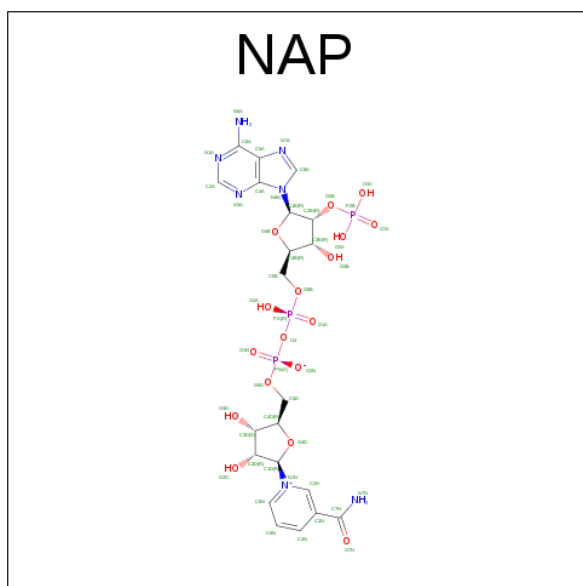
*Continued from previous page...*

Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
3	B	1	Total	C	O	0	0
			4	2	2		
3	B	1	Total	C	O	0	0
			4	2	2		

- Molecule 4 is CHLORIDE ION (three-letter code: CL) (formula: Cl).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
4	B	1	Total	Cl	0	0
			1	1		
4	A	1	Total	Cl	0	0
			1	1		

- Molecule 5 is NADP NICOTINAMIDE-ADENINE-DINUCLEOTIDE PHOSPHATE (three-letter code: NAP) (formula: C<sub>21</sub>H<sub>28</sub>N<sub>7</sub>O<sub>17</sub>P<sub>3</sub>).



Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
5	A	1	Total	C	N	O	P	0	0
			48	21	7	17	3		
5	B	1	Total	C	N	O	P	0	0
			48	21	7	17	3		

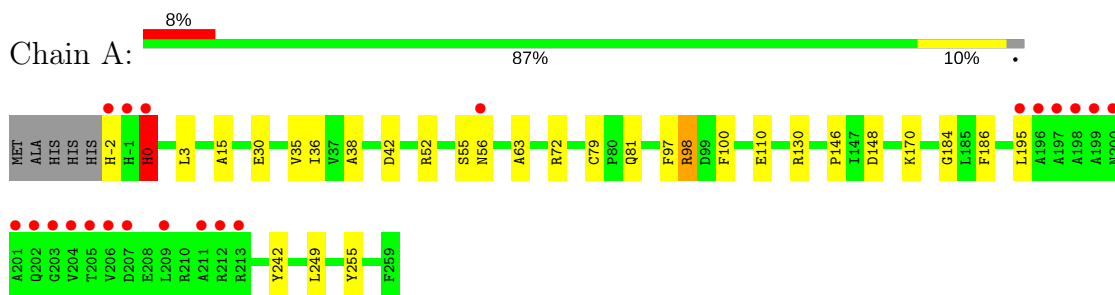
- Molecule 6 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
6	A	267	Total 269	O 269	0	2
6	B	295	Total 296	O 296	0	1

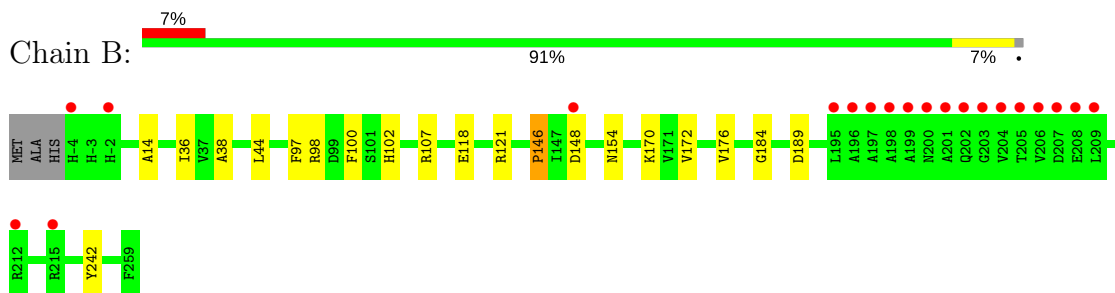
### 3 Residue-property plots [i](#)

These plots are drawn for all protein, RNA and DNA chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and electron density. Residues are color-coded according to the number of geometric quality criteria for which they contain at least one outlier: green = 0, yellow = 1, orange = 2 and red = 3 or more. A red dot above a residue indicates a poor fit to the electron density ( $RSRZ > 2$ ). Stretches of 2 or more consecutive residues without any outlier are shown as a green connector. Residues present in the sample, but not in the model, are shown in grey.

- Molecule 1: Short-chain dehydrogenase/reductase SDR



- Molecule 1: Short-chain dehydrogenase/reductase SDR



## 4 Data and refinement statistics

Property	Value	Source
Space group	P 43 21 2	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	109.72Å 109.72Å 111.04Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	50.00 – 1.85 45.15 – 1.85	Depositor EDS
% Data completeness (in resolution range)	100.0 (50.00-1.85) 100.0 (45.15-1.85)	Depositor EDS
$R_{merge}$	0.07	Depositor
$R_{sym}$	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ <sup>1</sup>	5.56 (at 1.86Å)	Xtriage
Refinement program	PHENIX	Depositor
R, $R_{free}$	0.145 , 0.174 0.144 , 0.174	Depositor DCC
$R_{free}$ test set	1953 reflections (3.35%)	DCC
Wilson B-factor (Å <sup>2</sup> )	21.2	Xtriage
Anisotropy	0.572	Xtriage
Bulk solvent $k_{sol}$ (e/Å <sup>3</sup> ), $B_{sol}$ (Å <sup>2</sup> )	0.33 , 46.7	EDS
L-test for twinning <sup>2</sup>	$\langle  L  \rangle = 0.49$ , $\langle L^2 \rangle = 0.32$	Xtriage
Estimated twinning fraction	0.014 for -h,l,k 0.010 for -l,-k,-h	Xtriage
$F_o, F_c$ correlation	0.97	EDS
Total number of atoms	4553	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	28.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.02% of the height of the origin peak. No significant pseudotranslation is detected.*

<sup>1</sup>Intensities estimated from amplitudes.

<sup>2</sup>Theoretical values of  $\langle |L| \rangle$ ,  $\langle L^2 \rangle$  for acentric reflections are 0.5, 0.333 respectively for untwinned datasets, and 0.375, 0.2 for perfectly twinned datasets.



## 5 Model quality

### 5.1 Standard geometry

Bond lengths and bond angles in the following residue types are not validated in this section: NAP, CL, EDO, SO4

The Z score for a bond length (or angle) is the number of standard deviations the observed value is removed from the expected value. A bond length (or angle) with  $|Z| > 5$  is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	$\# Z  > 5$	RMSZ	$\# Z  > 5$
1	A	0.87	1/1980 (0.1%)	0.90	4/2693 (0.1%)
1	B	0.85	0/1979	0.90	2/2690 (0.1%)
All	All	0.86	1/3959 (0.0%)	0.90	6/5383 (0.1%)

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	A	186	PHE	CE1-CZ	6.72	1.50	1.37

All (6) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	42	ASP	CB-CG-OD1	7.59	125.13	118.30
1	B	184	GLY	N-CA-C	-5.54	99.26	113.10
1	A	42	ASP	CB-CG-OD2	-5.41	113.43	118.30
1	A	184	GLY	N-CA-C	-5.38	99.66	113.10
1	A	52	ARG	NE-CZ-NH1	-5.06	117.77	120.30
1	B	189	ASP	CB-CG-OD1	5.02	122.82	118.30

There are no chirality outliers.

There are no planarity outliers.

### 5.2 Too-close contacts

In the following table, the Non-H and H(model) columns list the number of non-hydrogen atoms and hydrogen atoms in the chain respectively. The H(added) column lists the number of hydrogen atoms added and optimized by MolProbity. The Clashes column lists the number of clashes within the asymmetric unit, whereas Symm-Clashes lists symmetry related clashes.

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	1928	0	1938	18	0
1	B	1935	0	1939	13	0
2	A	10	0	0	0	0
2	B	5	0	0	0	0
3	A	4	0	6	0	0
3	B	8	0	12	0	0
4	A	1	0	0	0	0
4	B	1	0	0	0	0
5	A	48	0	25	1	0
5	B	48	0	25	2	0
6	A	269	0	0	6	0
6	B	296	0	0	2	0
All	All	4553	0	3945	28	0

The all-atom clashscore is defined as the number of clashes found per 1000 atoms (including hydrogen atoms). The all-atom clashscore for this structure is 4.

All (28) close contacts within the same asymmetric unit are listed below, sorted by their clash magnitude.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:107:ARG:NH1	6:B:401:HOH:O	2.00	0.91
1:A:81[A]:GLN:NE2	6:A:503:HOH:O	2.22	0.71
1:A:81[A]:GLN:OE1	1:A:130:ARG:NH1	2.15	0.69
1:A:72[A]:ARG:NH1	6:A:501:HOH:O	2.17	0.67
1:B:118:GLU:OE2	1:B:121:ARG:NH2	2.31	0.61
1:B:97:PHE:HA	1:B:100:PHE:CD2	2.37	0.60
1:A:3:LEU:HD12	1:A:30:GLU:HG3	1.90	0.54
1:A:-2:HIS:HB2	1:A:0:HIS:CE1	2.44	0.53
1:A:15:ALA:HB3	1:A:36[B]:ILE:HG23	1.90	0.51
1:A:97:PHE:HA	1:A:100:PHE:CD2	2.46	0.51
1:A:148:ASP:OD1	1:B:170[B]:LYS:HD2	2.10	0.51
1:A:56[A]:ASN:HA	6:A:534:HOH:O	2.12	0.49
1:A:55[A]:SER:OG	6:A:502:HOH:O	2.20	0.48
6:A:575:HOH:O	1:B:148:ASP:HB3	2.13	0.48
1:A:98:ARG:HG2	6:B:475:HOH:O	2.15	0.47
1:B:14:ALA:HB1	5:B:301:NAP:O4B	2.15	0.47
1:B:172:VAL:HA	1:B:176:VAL:O	2.18	0.44
1:B:97:PHE:HA	1:B:100:PHE:CE2	2.53	0.44
1:A:110:GLU:OE1	1:B:102:HIS:NE2	2.47	0.43
1:A:249:LEU:HD21	1:A:255:TYR:HB3	2.01	0.42
1:A:38:ALA:O	1:A:63:ALA:HA	2.20	0.42
1:A:38:ALA:HA	5:A:405:NAP:N3A	2.36	0.41

*Continued on next page...*

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:36:ILE:HG13	1:B:44:LEU:HD11	2.02	0.41
1:B:146:PRO:HB3	1:B:154:ASN:CG	2.41	0.41
1:A:56[B]:ASN:HA	6:A:534:HOH:O	2.20	0.41
1:A:35:VAL:HG21	1:A:79:CYS:HB2	2.03	0.41
1:B:38:ALA:HA	5:B:301:NAP:N3A	2.36	0.41
1:A:170[B]:LYS:HE3	1:B:98:ARG:NH2	2.36	0.40

There are no symmetry-related clashes.

## 5.3 Torsion angles [i](#)

### 5.3.1 Protein backbone [i](#)

In the following table, the Percentiles column shows the percent Ramachandran outliers of the chain as a percentile score with respect to all X-ray entries followed by that with respect to entries of similar resolution.

The Analysed column shows the number of residues for which the backbone conformation was analysed, and the total number of residues.

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	A	269/267 (101%)	259 (96%)	9 (3%)	1 (0%)	38	22
1	B	267/267 (100%)	262 (98%)	5 (2%)	0	100	100
All	All	536/534 (100%)	521 (97%)	14 (3%)	1 (0%)	51	35

All (1) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	0	HIS

### 5.3.2 Protein sidechains [i](#)

In the following table, the Percentiles column shows the percent sidechain outliers of the chain as a percentile score with respect to all X-ray entries followed by that with respect to entries of similar resolution.

The Analysed column shows the number of residues for which the sidechain conformation was analysed, and the total number of residues.

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	A	192/194 (99%)	187 (97%)	5 (3%)	51	34
1	B	193/194 (100%)	191 (99%)	2 (1%)	80	74
All	All	385/388 (99%)	378 (98%)	7 (2%)	62	50

All (7) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	0	HIS
1	A	98	ARG
1	A	146	PRO
1	A	195	LEU
1	A	242	TYR
1	B	146	PRO
1	B	242	TYR

Some sidechains can be flipped to improve hydrogen bonding and reduce clashes. There are no such sidechains identified.

### 5.3.3 RNA [i](#)

There are no RNA molecules in this entry.

## 5.4 Non-standard residues in protein, DNA, RNA chains [i](#)

There are no non-standard protein/DNA/RNA residues in this entry.

## 5.5 Carbohydrates [i](#)

There are no carbohydrates in this entry.

## 5.6 Ligand geometry [i](#)

Of 10 ligands modelled in this entry, 2 are monoatomic - leaving 8 for Mogul analysis.

In the following table, the Counts columns list the number of bonds (or angles) for which Mogul statistics could be retrieved, the number of bonds (or angles) that are observed in the model and the number of bonds (or angles) that are defined in the chemical component dictionary. The Link column lists molecule types, if any, to which the group is linked. The Z score for a bond length (or angle) is the number of standard deviations the observed value is removed from the expected

value. A bond length (or angle) with  $|Z| > 2$  is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\# Z  > 2$	Counts	RMSZ	$\# Z  > 2$
2	SO4	A	401	-	4,4,4	0.27	0	6,6,6	0.59	0
2	SO4	A	402	-	4,4,4	0.16	0	6,6,6	0.37	0
3	EDO	A	403	-	3,3,3	0.82	0	2,2,2	0.52	0
5	NAP	A	405	-	44,52,52	0.80	1 (2%)	51,80,80	0.87	3 (5%)
5	NAP	B	301	-	44,52,52	0.89	1 (2%)	51,80,80	0.86	1 (1%)
2	SO4	B	302	-	4,4,4	0.59	0	6,6,6	0.50	0
3	EDO	B	303	-	3,3,3	0.65	0	2,2,2	0.39	0
3	EDO	B	304	-	3,3,3	0.65	0	2,2,2	0.17	0

In the following table, the Chirals column lists the number of chiral outliers, the number of chiral centers analysed, the number of these observed in the model and the number defined in the chemical component dictionary. Similar counts are reported in the Torsion and Rings columns. '-' means no outliers of that kind were identified.

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
2	SO4	A	401	-	-	0/0/0/0	0/0/0/0
2	SO4	A	402	-	-	0/0/0/0	0/0/0/0
3	EDO	A	403	-	-	0/1/1/1	0/0/0/0
5	NAP	A	405	-	-	0/27/67/67	0/5/5/5
5	NAP	B	301	-	-	0/27/67/67	0/5/5/5
2	SO4	B	302	-	-	0/0/0/0	0/0/0/0
3	EDO	B	303	-	-	0/1/1/1	0/0/0/0
3	EDO	B	304	-	-	0/1/1/1	0/0/0/0

All (2) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
5	A	405	NAP	C7N-N7N	2.19	1.37	1.33
5	B	301	NAP	P2B-O2B	3.55	1.65	1.59

All (4) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
5	A	405	NAP	C4N-C3N-C7N	-2.06	115.60	121.07
5	B	301	NAP	O2X-P2B-O1X	2.04	118.48	110.50
5	A	405	NAP	C2N-C3N-C7N	2.23	125.82	119.34
5	A	405	NAP	O2N-PN-O1N	2.25	123.91	112.28

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

2 monomers are involved in 3 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
5	A	405	NAP	1	0
5	B	301	NAP	2	0

## 5.7 Other polymers [i](#)

There are no such residues in this entry.

## 5.8 Polymer linkage issues [i](#)

There are no chain breaks in this entry.

## 6 Fit of model and data

### 6.1 Protein, DNA and RNA chains

In the following table, the column labelled ‘#RSRZ > 2’ contains the number (and percentage) of RSRZ outliers, followed by percent RSRZ outliers for the chain as percentile scores relative to all X-ray entries and entries of similar resolution. The OWAB column contains the minimum, median, 95<sup>th</sup> percentile and maximum values of the occupancy-weighted average B-factor per residue. The column labelled ‘Q < 0.9’ lists the number of (and percentage) of residues with an average occupancy less than 0.9.

Mol	Chain	Analysed	<RSRZ>	#RSRZ>2	OWAB(Å <sup>2</sup> )	Q<0.9
1	A	262/267 (98%)	0.15	21 (8%) 13 13	15, 21, 62, 81	0
1	B	264/267 (98%)	-0.04	20 (7%) 15 15	14, 22, 54, 76	0
All	All	526/534 (98%)	0.06	41 (7%) 14 14	14, 22, 56, 81	0

All (41) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	-1	HIS	6.2
1	A	-2	HIS	5.8
1	B	197	ALA	5.2
1	A	197	ALA	5.2
1	B	200	ASN	5.1
1	B	201	ALA	4.9
1	A	196	ALA	4.7
1	A	199	ALA	4.6
1	B	203	GLY	4.6
1	B	-4	HIS	4.5
1	A	200	ASN	4.2
1	B	204	VAL	4.1
1	B	202	GLN	4.0
1	B	195	LEU	4.0
1	A	202	GLN	3.9
1	B	206	VAL	3.9
1	A	203	GLY	3.9
1	A	195	LEU	3.8
1	A	206	VAL	3.8
1	A	198	ALA	3.7
1	A	205	THR	3.7
1	A	204	VAL	3.7
1	A	201	ALA	3.7
1	B	198	ALA	3.6

*Continued on next page...*

*Continued from previous page...*

Mol	Chain	Res	Type	RSRZ
1	B	199	ALA	3.5
1	A	209	LEU	3.2
1	B	148	ASP	3.1
1	B	209	LEU	3.1
1	B	205	THR	3.0
1	A	212	ARG	2.9
1	B	215	ARG	2.6
1	B	207	ASP	2.6
1	A	56[A]	ASN	2.5
1	B	196	ALA	2.5
1	A	0	HIS	2.4
1	A	211	ALA	2.4
1	B	-2	HIS	2.3
1	B	212	ARG	2.2
1	B	208	GLU	2.2
1	A	207	ASP	2.1
1	A	213	ARG	2.1

## 6.2 Non-standard residues in protein, DNA, RNA chains [i](#)

There are no non-standard protein/DNA/RNA residues in this entry.

## 6.3 Carbohydrates [i](#)

There are no carbohydrates in this entry.

## 6.4 Ligands [i](#)

In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. LLDF column lists the quality of electron density of the group with respect to its neighbouring residues in protein, DNA or RNA chains. The B-factors column lists the minimum, median, 95<sup>th</sup> percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9' lists the number of atoms with occupancy less than 0.9.

Mol	Type	Chain	Res	Atoms	RSCC	RSR	LLDF	B-factors(Å <sup>2</sup> )	Q<0.9
5	NAP	B	301	48/48	0.96	0.09	0.73	15,20,23,26	48
3	EDO	B	304	4/4	0.75	0.17	0.10	55,55,56,60	0
3	EDO	B	303	4/4	0.77	0.16	0.10	63,64,64,66	0
2	SO4	A	401	5/5	0.98	0.08	-0.71	22,24,31,32	5

*Continued on next page...*



*Continued from previous page...*

Mol	Type	Chain	Res	Atoms	RSCC	RSR	LLDF	B-factors( $\text{\AA}^2$ )	Q<0.9
2	SO4	B	302	5/5	0.99	0.07	-0.98	22,22,25,26	0
5	NAP	A	405	48/48	0.98	0.07	-1.16	15,19,22,25	0
3	EDO	A	403	4/4	0.74	0.14	-	42,46,51,53	0
4	CL	A	404	1/1	0.94	0.12	-	71,71,71,71	0
4	CL	B	305	1/1	0.73	0.08	-	61,61,61,61	0
2	SO4	A	402	5/5	0.86	0.18	-	75,77,78,81	5

## 6.5 Other polymers [i](#)

There are no such residues in this entry.