

Public Works (1894) Department.

RAILWAY BRANCH.

G.O., No. 511 R

DATED 1st October

[Despatch Abstract.]

Inspection report of the Southern Mahratta Railway (including the Mysore, Kolhapur & Bellary & Kistna State Railways). — Letter from the Govt of Bombay, Public Works Department, Railway Branch, forwarding copies of the periodical — for the first half of 1894, recorded.

BACK PAPERS.

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SOUTHERN MAHRATTA RAILWAY SYSTEM (METRE GAUGE).

TOTAL MILEAGE OPEN FOR TRAFFIC (1,555 MILES).

Inspection Report by Lieut.-Colonel H. O. Selby, R.E., Senior Government Inspector of Railways, Bombay, for the half-year ending 30th June 1894.

The inspection of this system was made between 19th July and 1st August 1894, both days inclusive. The whole line was inspected by day-light and by special train. I was accompanied throughout the inspection by Colonel J. G. Lindsay, R.E., the Acting Agent, Mr. Scott, Chief Engineer, Mr. Whitcombe, Locomotive Superintendent, Mr. Muirhead, Traffic Manager, and Dr. Chenai, the Company's Chief Medical Officer. I also had the pleasure of seeing and being accompanied by the various District Officers within the limits of their respective charges.

2. Speaking of the system as a whole I consider that the way, works, quarters and stock are in good order and well maintained, and that the general condition of things on the system is satisfactory. It must be remembered that the Southern Mahratta Railway system is in the first place very new. When I first went over it in May 1885, there were only 173 miles, *i.e.*, from Hotgi to Gadag, open for traffic. Since then it has grown by leaps and bounds to the great system that exists to-day. Not only is this the case, but the system consists of many parts and was constructed by various Agencies. For example, the Poona Branch was constructed by the Company, the Bijapur Branch was begun as a famine work and finished by the Company, the main line from Castle Rock to Bellary was made by the Company, the length from Bellary to Guntakal was a piece of the Madras Railway purchased by the Secretary of State, and converted to the metre gauge by the Company, the Guntakal-Bezwada length was commenced as a State Railway and finished by the Company, the Southern Extension was constructed by the Company, as were also the piece of the Mysore State Railway between Harihar and Gubbi, the Nanjangud Extension and the Kolhapur State Railway, whilst the length from Yesvantpur to the Mysore Frontier near Hindupur was constructed by the Mysore Darbar, and the length from the Frontier to Guntakal by the Agency of the South Indian Railway. The portion of the system Guntakal to Bangalore was opened through, less than a year ago.

This rapid growth of the system has necessarily caused considerable difficulties in every Department. The staff have had to be rapidly increased and, as happens on all new lines in India, the staff so got together contained a considerable percentage of very indifferent men, the rejections of the older lines. There was also the difficulty of considerable changes in the heads of all Departments, including the Agency, except the Locomotive Department.

Taking all these things into consideration, I think the work done has been on the whole not unsatisfactory, and I feel sure that the general conduct of business will show a continued improvement in the future.

3. **Rails and Fastenings.**—These are generally in good order. The length between Bellary and Guntakal is laid with the old Madras rails and sleepers, and the length, seven miles between the Mysore Frontier and Hindupur, is laid with iron rails, as are also the sidings in station yards between the Frontier and Guntakal. On this section also the rails and fastenings are of a somewhat different pattern to those in use on the Southern Mahratta Railway proper. I noticed many bent rails between Byadgi and Ranibennur on the Southern Extension, at the following mile-ages between Yesvantpur and the Mysore Frontier: 119, 114, 113, 112, 106, 96, 95, 89 and 88. Also on the Guntakal-Hindupur length, north of Penukonda station, the curves seemed to me very shapeless, and I noticed many bent rails. But the worst section is that part of the Bellary-Kistna Railway between Panyam and Bezwada, in which there are a very great number of rails that need straightening,

in fact I do not consider that the condition of this length is at all satisfactory. For details of rail renewals see Appendix A.

4. **Sleepers.**—The sleepers on the system seem generally in good order except on those parts of the Poona Branch, where Khari wood was used, and on the part of the main line from Londa to Hubli, in which I suppose unseasoned sleepers had to be laid, and where they have not been renewed fast enough. I understand that the tough steel sleepers on this system are not giving satisfaction, and that they are failing much earlier and more rapidly than could have been anticipated. I think that they are of doubtful value or, at all events, that their worth remains still to be proved.

With regard to the Khari wood sleepers, which are on the Poona end of the Poona Branch, including the two ghât sections, energetic steps are being taken for their removal. On the Jejuri Ghât, they have been already renewed. On the Alandi Ghât there are in hand and laid about 7,000 steel and 2,000 teak sleepers, which are being laid in continuously as fast as possible. The teak sleepers being laid in curves of 800 feet radius or less, and the steel in flatter curves or straight pieces. About 250 are being laid daily under the charge of a special Permanent Way Inspector.

On the Salpa Ghât the Khari wood sleepers are in better condition than on the Alandi and Jejuri Ghâts, but the road is being strengthened by the addition of 3,500 steel sleepers.

The bad sleepers between mileages 205-206 were all removed during the half-year. For details of sleeper renewals see Appendix B.

5. **Ballast.**—Generally the system may be said to be fairly fully ballasted and the general condition of the ballast to be good. Of course on so great a system both the quality and quantity of the ballast varies in parts. I noticed ballast either thin or indifferent in quality on the Poona Branch at mileages 273 and 179; also towards Miraj the ballast was often thin and in many places seemingly was decayed moorum; at mileages 59 and 57, and also between Belgaum and Desur; also in places between the Portuguese Frontier and Dharwar; on the Southern Extension near Gadgeri, and at mileage 5 of the Mysore State Railway. Appendix C gives details of ballast spread, &c., during the half-year.

6. **Banks and Cuttings.**—These are generally well maintained, but I do not like the narrowness at the top of many of the high banks on the ghâts near Poona. They are, it is true, being gradually widened, but many of them seem to me very thin at the top, hardly wider in places than the bottom of the ballast.

7. **Signals.**—The signals on the system are generally well placed, well displayed, and well maintained. The wooden blocks to which I alluded in paragraph 5 of my report of last half-year (dated 8th March 1894) have been removed. I, however, noticed and pointed out to the District Engineers concerned a few cases in which the chain passing over the idle pulley had been fixed with wire.

There is, however, one important point regarding the distant signals on this system to which I desire to draw attention. These signals show by day "danger" and "caution" only; but the spectacle has only one glass—a red one—so that at night they show either red or white. The great danger of this is that, should the red glass either fall out or get broken, the light will show to the driver of an approaching train as if the signal had been lowered to admit him. I think all distant signals should show both red and green and only red and green.

8. **Fencing.**—There is really very little fencing on the system. Where it exists at all, it is either (a) Live fencing, chiefly American aloe, (b) Stone walling, or (c) Iron wire. Little or nothing has been done in the way of renewals or extensions during the half-year as will be seen from Appendix D.

(a) Where live fencing exists it is in fair order, but is full of gaps.

(b) The stone walling, which is chiefly on the ghâts near Poona and Salpa, has been allowed to fall into absolute ruin. I understand that no

repairs have been done to it pending the settlement of the section of wall to which it is to be rebuilt, and it is now in ruins and quite useless. The matter of its section should be settled and the walling renewed forthwith. It should never have been allowed to get into its present condition. Revenue should have maintained it constantly in good order and should now replace it without delay.

(c) The iron wire fencing where it exists is fairly maintained. Temporary arrangements have been made to close the gaps and to guard the road-crossings.

9. **Bridges.**—The bridges on the system are generally well maintained. I noticed that the cross-sleepers on the bridge just north of Goribidnur Station required tarring. The girders of the Dhon Bridge on the Bijapur Branch continue to creep. Steps are being taken to put in plates between the girders to limit the creep.

Appendix E gives the details of work done in the half-year.

10. **Refreshment-rooms.**—These are uniformly clean and neat. I looked at the complaint books and found that the Refreshment-rooms seem to give uniform satisfaction to the public using them. I consider that this reflects very great credit on the officers of the Company, especially when it is remembered that this system has a very small 1st and 2nd passenger traffic indeed.

11. **Stations, Offices, Staff Quarters, &c.**—The stations and offices on the system are generally kept very nice and clean, and the various time and fare tables are properly displayed for all stations on the system.

(a) The general condition of the staff quarters and their surroundings has been very greatly improved since my last inspection in January last, and I was pleased to see that the untidiness I then noticed has given place to order and cleanliness.

(b) I went over the General Offices at Dharwar and found them in excellent order.

12. **Land.**—I carefully noticed with the Acting Agent the matter of the proper demarcation of the land in this Company's possession by proper boundary marks in accordance with the orders laid down by the Government of India. Where fences exist they are on the boundaries of the Company's land. In other places more or less boundary stones exist, but hitherto they have not been numbered or entered on the plans; in many places also they have been removed by villagers, and in many though left standing, the cultivators have encroached on the Company's lands, and in cases are cultivating almost up to the line. This should be stopped as much as possible, as otherwise when fencing comes to be erected there will be all sorts of difficulties and claims. Between Dharwar and Gadag I saw only a few boundary stones; on the Southern Extension there was hardly any; between Haveri and Byadgi there were practically none, and the cultivators had encroached right up to the line; and the same remark applies to mileage 79 on the Southern Extension. On the unfenced portion of the Mysore State Railway there are boundary stones in places, but the cultivators have encroached greatly on Railway land. On the Hindupur-Guntakal and Guntakal-Bezwada sections there are at present plenty of boundary stones which only need to be properly maintained.

13. **General Stores.**—I visited the General Stores building at Hubli and found it in very good order and very clean and with the stores well arranged.

14. **Poona Branch.—Poona Junction to Londa Junction 278 miles.**—The rails throughout are 41½ lbs. flat-footed steel. The sleepers are wood from Londa Junction to Belgaum, mileage 33, steel mostly of new pattern to mileage 40, wood to mileage 66, and thence steel to Poona except on the Ghâts where wood is used for curves of 800 feet radius or less.

(a) Wathar Station on this branch needs enlarging and a plan and estimates will be submitted.

15. **Main Line.—Portuguese Frontier to Bezwada, 512 miles.**—From the Frontier to Castle Rock the rails are 60 lbs. steel with special teak sleepers

of heavy section. From Castle Rock to Bellary, mileage 204, the rails are 41½ lbs. steel. The sleepers being Castle Rock to mileage 97 teak, then to Gadag Junction old pattern steel, Gadag Junction to Bellary steel, partly old and partly new pattern. Between Bellary and Guntakal Junction the line was converted from the standard gauge to the metre and consists of old Madras Railway iron rails 69 lbs. on Madras Railway cast iron pots. From Guntakal Junction the whole line is laid with 41½ lbs. steel rails on steel sleepers up to Pendekallu, mileage 261, thence to Nandyal, mileage 324, wood, and thence to Bezwada new pattern steel except on sharp curves necessitating guard rails where the sleepers are of wood.

16. Southern Extension.—Hubli to Harihar, 81½ miles.—The rails are 41½ lbs. steel. The sleepers being of jungle teak as far as Haveri, 46½ miles, thence to Harihar old pattern steel.

17. Mysore State Railway and Nanjangud Extension, 311½ miles.—The line is laid with 41½ lbs. steel rails on Mysore teak sleepers except about 6 miles between Harihar and Arsikere where old steel sleepers are used.

18. Yesvantpur to British Frontier, 51½ miles.—This length was constructed by the Mysore Darbar. The permanent way consists of 41½ lbs. steel rails on Mysore teak sleepers.

19. Frontier to Guntakal Junction, 112½ miles.—This section was constructed by the South Indian Railway Company; it is laid with iron rails from the Frontier to Hindupur, thence with 41½ lbs. steel rails on steel sleepers. The sidings in station yards are of iron.

20. Appendices F, G, H, J, K and L give the details of Capital Works begun, in progress or completed, on the various sections of the system. It will be noted that the divisions into which the line is divided for engineering maintenance do not correspond with the divisions given in paras. 14 to 19 above.

21. Kolhapur State Railway, 29½ miles.—The road consists of 41½ lbs. steel rails on new pattern steel sleepers. The line is fully ballasted and in excellent order. The only work in progress is the pitching of banks near the Kistna and Panchganga Bridges. This work is about ¾ completed.

LOCOMOTIVE.

22. I inspected the Locomotive and Carriage and Wagon Shops at Hubli and at Bangalore.

23. Bangalore Shops.—The following new machinery has been received and erected during the half-year: 1 wheel lathe, 1 small planing machine, 1 slotting machine, 1 Brass finisher's lathe, 1 drilling machine, 1 set of plate rolls and 1 20 horse-power portable engine.

No additions or renewals of engine stock were made at the Bangalore shops; but 4 engines were completely repaired; also 76 coaching and 94 goods wagons were repaired during the half-year, and the special repairs of 16 more, damaged in an accident at Bangalore, were in progress.

24. Hubli Workshops.—I found these shops in excellent order. The work in them is said to be so heavy that it will be necessary to enlarge them. For this two schemes have been got out, the smaller of which it is proposed to carry out at once and the larger, which involves taking in the existing general stores and re-building the stores building in another place, at some time in the future.

(a). During the half-year the following machinery was received and erected: 2 new lathes in the machine shop and one radial drilling machine in the boiler shop.

An estimate amounting to about 1½ lakhs has been sanctioned by the Government of India for additional machinery for the shops and the indent has been sent to England for compliance.

(b). In the shops the following works were done by the Engineering Department during the half-year:—A drain pipe at the west end of the

smithy, ventilators above the top lights in the smithy, extending 2 engine-pits for valve setting and the provision of 2 additional pits for weighing engines in the erecting shop, a drain below the saw mill platform was covered in with stone slabs and urinals were provided in the yard for the workshop staff.

(c). Appendix M is a statement showing the average engine mileage run by the stock during the year. Engine failures continued to give trouble during the year, but I cannot help thinking that a not inconsiderable proportion of them was due to bad or careless drivers, and I hope to see a marked improvement now that some of the Assistant Locomotive Superintendents are posted to the districts and as the Company gets more and more men trained by itself. A difficulty however is that trained men go away to cheaper places than are to be found on the Southern Mahratta Railway system.

(d). The following is a statement of some of the work done in the shops during the half-year:—There were no additions or renewals of engine stock. As to repairs of engine stock, on 1st January 1894 there were 43 engines in the shops; 25 were received during the half-year. The repairs of 35 were commenced, and of these 31 were completed and turned out of the shops. The repairs to all engines dealt with during the half-year were heavy. Twenty-eight new tube plates were put in and 20 extended smoke boxes were substituted for old pattern ones. In addition the repairs of 2 engines returned from construction on the Hindupur line were in progress.

(e). In the goods and coaching stock there were no additions, but 1 inspection carriage, 1 van for Weighing Machine Inspector, 1 brake van and 2 ordinary thirds were renewed. 262 coaching and 544 goods vehicles were repaired during the half-year. Against the sanction for converting 350 low-sided wagons into coal wagons capable of carrying the full load admissible with a gross load on each journal of 2½ tons, 90 ordinary low-sided wagons were converted. 50 sets of iron work for doors and 160 sets of angle iron work were completed.

(f). **Fitting stock with Jones's Buffers.**—The ordinary buffers of 80 coaching vehicles were replaced by Jones's buffers and the ordinary buffers of 29 goods vehicles were similarly dealt with.

25. Fitting stock with Pintsch's system of oil gas lights.—The question has been under consideration and estimates have been framed. Approximately the total cost of fitting the whole of the coaching stock will amount to about 3 lakhs of rupees; this sum includes the cost of plant, works, &c., at Hubli only with means of re-charging at Belgaum, Gadag and Guntakal. It may possibly be necessary to arrange for re-charging at Arsikere also.

26. No steps have been taken towards fitting any of the stock with the automatic vacuum brake. Generally I consider the rolling stock well maintained, but it seemed to me that an undue proportion of the coaching stock needed repainting.

27. Water-supply.—Closely connected with the working of the Locomotive Department is the question of the supply of water for the engines. At the time of my visit the Hubli Water-works, to which the Southern Mahratta Railway Company contributed 2½ lakhs of rupees, were finished; but the Municipality had not yet commenced to supply the shops, water being still pumped from the Jowl Nāla.

28. The following remarks as regards water-supply are based on notes supplied to me by the Locomotive Superintendent:—

(a) **Poona Branch.**—There are two stations on this branch the water-supply of which is of bad quality, namely, Miraj and Pachhapur. It is proposed to obtain water from the Kistna for the former, and arrangements have already been made at the latter, to erect a steam pump and to draw from a nāla near the station, instead of from the well.

2. At Kudchi the yield is uncertain, and it is intended to supply that station also from the Kistna, by means of a steam pump. At present, engines have to get water at temporary tanks, between Kudchi and Raibag, when the supply at the former fails.

(3). Between Chikodi Road and Gokak Road a temporary arrangement has been in use for a long time, all trains having to stop between stations; it has now been arranged to obtain a supply from the Ghatparbha river, through the Irrigation Department and to pump into Gokak Road Station.

(b) **Harihar Branch.**—At Saunshi and Yalvigi, the quality is unsatisfactory, but only goods trains use the former, and although efforts have been made to secure a supply better suited to boilers, they have not been successful; Yalvigi water is not very bad, but if better can be obtained within a convenient distance, it will be utilised.

(c) **Mysore State Railway.**—Harihar, Holalkere and Banasandra wells, all supply water of very bad quality; for Harihar, it is intended to pump from the Tungbhadra; at Holalkere, there is no good water to be had and inquiries are now being made at Chik Jajur, Sasalu and Ramagiri; at Banasandra, water of satisfactory quality has been found in a nala, a few hundred yards to the north of the station; this has been used, by means of temporary tanks, for the last six months, and proposals have now gone forward for the erection of a small steam pump.

(2). At several stations on the Mysore Railway, the water-supply has not been analysed, but no trouble is experienced with engines on account of water, except at the stations mentioned in the previous paragraph.

(3). The yield at some of the stations on the Mysore Railway is sometimes deficient, and improvements or supplementary supplies are proposed at the following places:—

Kodaganur.
Tumkur.
Dodbele.

Closepet.
Maddur.

(d) **Bangalore-Guntakal Section.**—There is some bad water on this Section, but some analyses have still to be obtained; the results of analysis of the supplies furnished at Dharmavaram and Khadarpett are unsatisfactory and Hindupur is now complained of by drivers. The requirements of the whole section will have to be fully considered.

(e) **Main Line.**—The worst water on the main line is that at Satulur; the supply is to be abandoned altogether and Narasaravapet substituted as a watering station. A good sample has been found and the yield is ample.

(2). The results of analysis of samples taken from Dhārwar, Gadiganur, Pendekallu, and Somidevipalli are not very satisfactory, and these stations are receiving attention in turn. At Dharwar the Municipality is contemplating a large scheme for water-supply, and it has been proposed that the Company should contribute 1½ lakhs of rupees, getting 30,000 gallons a day free and water for staff quarters at half rates. The matter is still under consideration, but the plans and estimates for the scheme are complete.

(3). The yield from the well at Kurnool Road only suffices for an average of four engines daily; the demand has frequently been in excess, and consequently temporary arrangements have had to be made at a stream a short distance east of the station.

(4). A considerable amount of expenditure will have to be incurred at Nancherla, whence the Guntakal supply is procured; the pumps and boilers were placed too far apart, and the cost of working has consequently been far higher than it should have been; proposals have been sent forward for re-arrangement.

(f) **Bijapur Branch.**—Bijapur and Bagalkot are the only stations on this branch, where an improvement in quality is of importance, the results of the original analysis being unsatisfactory. It is intended to re-analyse samples from these wells.

Appendix N gives the results of the analysis of water from different sources on the Southern Mahratta Railway system.

TRAFFIC.

29. As I have already stated the Southern Mahratta Railway system is comparatively young and not inconsiderable portions of it, such as the Bijapur Branch and the Bellary-Kistna Railway, were first undertaken as protection

against famine. Much of the country served is poor and sparsely inhabited, so that it is not a matter of wonder that the traffic on the whole should not give a great return on the capital expended. The Poona Branch, the main line from the Frontier to Guntakal, and the Mysore State Railway—Harihar to Mysore—do a fair traffic; but traffic is of the smallest on the Bellary-Kistna Railway and the length between Bangalore and Guntakal. Perhaps the following statement of the stations that do a good or a fair traffic will bring this out more clearly:—

(a) On the Poona Branch the following stations do a good traffic:—Poona, Nira, Karad, Shenoli, Sangli, Miraj, Shedbal and Belgaum, and the following do a fair traffic: Satara Road, Koregaon, Rahimatpur, Kundal Road, Ashta Road, Kudchi, Chikodi Road, Gokak Road, Dhupdhal, Pachhapur and Suldhali. The remaining 19 do practically nothing, that is, there are 7 good, 11 fair, and 19 bad stations.

(b) On the main line as far as Guntakal Junction the good stations are:—Alnavar, Hubli, Gadag, Hospet and Bellary. All the rest, 27 in number, do little or nothing.

(c) Main Line, Guntakal to Bezwada.—The good stations are:—Kurnool Road and Guntur, and the fair ones are Nandyal, Cumbum, Narasaravapet and Sattenapalle, or 2 good, 4 fair, and 28 that do little or nothing.

(d) On the Southern Extension we get no good station, 2 fair, i.e., Haveri and Harihar, and 10 that do little or nothing.

(e) On the Mysore State Railway the following are good:—Tiptur and Tumkur, and the following fair: Davangere, Holalkere, Birur, Kadur, Arsikere, Gubbi, Closepet, Channapatna, Maddur, Paschamvahini and Mysore, or 2 good, 11 fair, and 32 that do little or nothing.

(f) Between Guntakal and Bangalore there are no good stations; the following are fair: Goribidnur, Hindupur, Dharmavaram and Anantapur, the remaining 17 doing little or nothing, or 0 good, 4 fair and 17 little traffic to speak of.

(g) The Kolhapur State Railway has 1 good station, Kolhapur, and 3 that do little or nothing.

30. However the gross receipts on the whole system during the last half-year have been the largest on record. On the Mysore Railway, however, there was a falling off as compared with the corresponding period of last half-year. The crops in Mysore were good, but it is reported that traders held back with a view to secure better markets. Rain was also deficient in certain parts of Mysore, and that encouraged a further holding back. On the Southern Mahratta Railway proper there was during the half-year a general increase in almost all commodities. The Poona Branch in especial has been busier than it ever was, and more traffic from the main line has followed the Poona route in preference to the sea route *via* Marmagão. The main line has also been busier than usual. The Traffic Manager informs me that the ground-nut traffic was larger than in the previous half-year, while a great impetus was given to the trade in cottonseed by the large purchases in Southern Mahratta Railway markets of cottonseed for export.

31. As regards the passenger traffic, a most important change was introduced on 1st January 1894. On that day the 3rd class fares on the sections Guntakal to Castle Rock and the Poona Branch were reduced from 2½ pies per mile to 2 pies, thus making the 3rd class fare 2 pies per mile over the whole system. The reduced fare has not, perhaps, been long enough in existence to enable it to be said definitely that it has been a success. The number of passengers on the section has increased, but possibly some part of the increase is due to regular growth of traffic. However I understand that both the Acting Agent and the Traffic Manager consider that the increase is mainly due to the reduction and that the experiment has been a success.

32. The Acting Agent has also, at the suggestion of Colonel Firebrace, R.E., put forward a proposal for fitting 3rd class carriages with moveable glass windows to the doors and with moveable instead of fixed louvres to the windows which should make them far more comfortable. The estimates are now before the Board of Directors.

33. A number of important changes in the procedure to be followed in train notices, train ordering, movement of vehicles and trains have been introduced during the half-year, but it is too early as yet to estimate their advantages.

Although the line is worked with block instruments, considerable difficulty has arisen at times with double or false line-clear tickets, and the Traffic Manager is trying to overcome the difficulty by a system of private numbers given to Station Masters and Guards.

GENERAL.

34. On my inspection I saw and approved the following works that had been opened without previous inspection :—

A set of points and crossings at Kambarganvi Station.

A set of points in the main line at Nira Station.

5 new spans of 40' plate girders added to an original one 40' bridge at mileage 468, main line.

3 new 40' plate girder bridge at mileage 474, main line.

2 new 40' plate girders in place of two 20' girders removed at mileage 475, main line.

New 20' girder opening at mileage 293, main line.

Rebuilt 10' girder opening at mileage 292, main line.

1 span 20' girder added to one 20' girder at mileage 279, main line.

Diversion at mileage 126, main line.

Diversion at mileage 57, Bijapur branch.

35. At Nanjangud it is proposed to continue the main line a little further so as to get closer to the town. Nothing further has been settled regarding the rival schemes for an extension from here through Gundalpet to Guddalur or for extending the line to form a junction with the South Indian Railway at Erode Junction. Nor have the various proposals for a line joining Arsikere and French Rocks with a branch from Hassan to Mangalore yet taken definite shape.

During the half-year the Acting Agent put forward a large scheme for a railway from Karad Road Station on the Poona Branch down the Khambarli Ghât to Chiplun and then up the Southern Konkan to a point opposite to Bombay at Hog Island, a distance of some 200 miles. The project is as yet in embryo and is being considered by various local bodies and officers to whom it has been referred by Government. It would be an undoubted advantage to the Southern Mahratta Railway system to have an independent outlet to the sea, and it would serve a country at present without railway communication.

I understand that His Highness the Nizam has it in contemplation to construct a metre gauge railway from Manmad on the G. I. P. Railway to Secunderabad. Should such a line be constructed it would possibly be well to extend the Southern Mahratta Railway from Hotgi to form a junction with it and so take the first step in forming the link between the two great metre gauge systems of Northern and Southern India.

H. O. SELBY,

Senior Government Inspector, Bombay.

Poona, 25th August 1894.

APPENDIX A.

SOUTHERN MAHARATTA RAILWAY.

Statement showing the Miles of Rails renewed during the half-year ending 30th June 1894.

Divisions.	IRON.				STEEL.				REMARKS.
	Double-headed weighing 75 lbs. per yard.	Bridges weighing 80 lbs. per yard.	Double-headed weighing 74 lbs. per yard.	Total.	Flat-footed weighing 4½ lbs. per yard.	Steel weighing 40½ lbs. per yard.	Steel weighing 62 lbs. per yard.	Total.	
Bellary Division...	0.07	.....	.....	0.07	0.25	.....	.....	0.25	
Gadag Division...	.....	.....	.....	.....	0.25	.....	.....	0.25	
Hubli Division...	.....	.....	.....	.....	0.07	.....	.....	0.07	
Poona Division...	.....	.....	.....	.....	0.04	.....	.....	0.04	
Kistna Division...	.....	.....	.....	.....	0.01	.....	.....	0.01	
Mysore Division...	.....	.....	.....	.....	0.08	.....	.....	0.08	
Total ...	0.07	.....	.....	0.07	0.70	.....	.....	0.70	

APPENDIX B.

SOUTHERN MAHARATTA RAILWAY.

Statement showing the number of Sleepers renewed during the half-year ending 30th June 1894.

Divisions.	Wood.													
	Teak Sleepers of various sizes.		Teak Bridges of various sizes.		Australian 6' x 8" x 4".		Jungle, 12' x 9" x 4".		Jungle, 6' x 9" x 6".		Jungle, 11' x 9" x 6".		Sai 6' x 6" x 5".	
	Number of Sleepers on the Line at the commencement of the half-year.	Number of Sleepers renewed during the half-year.	Number of Sleepers on the Line at the commencement of the half-year.	Number of Sleepers renewed during the half-year.	Number of Sleepers on the Line at the commencement of the half-year.	Number of Sleepers renewed during the half-year.	Number of Sleepers on the Line at the commencement of the half-year.	Number of Sleepers renewed during the half-year.	Number of Sleepers on the Line at the commencement of the half-year.	Number of Sleepers renewed during the half-year.	Number of Sleepers on the Line at the commencement of the half-year.	Number of Sleepers renewed during the half-year.	Number of Sleepers on the Line at the commencement of the half-year.	Number of Sleepers renewed during the half-year.
Bellary Division...	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.
Gadag Division ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Hubli Division ...	402,412	7,105	3,377	...	...	...	...	...	...	...	...	...	...	...
Poona Division ...	50,270	1,029	3,393	...	41,908	414	119	...	...	...	...	...	...	...
Kistna Division ...	27,875	470	8,416	...	...	...	...	...	...	...	...	...	...	...
Mysore Division...	630,018	(c) 13,031	...	...	...	...	...	1,55,601	...	...	...	...	...	...
Total ...	1,120,243	22,620	24,243	...	41,908	414	119	...	1,50,393	...	219	...	437	...

Divisions.	Wood.						CAST IRON AND STEEL.									
	Creosoted Pine 9' x 10" x 5".		Creosoted Crossings 6' x 9" x 4 1/2".		Total.		Longitudinal.		Bowl Sleepers.		Wrought Iron Subway.		Steel.		Total.	
	Number of Sleepers on the Line at the commencement of the half-year.	Number of Sleepers renewed during the half-year.	Number of Sleepers on the Line at the commencement of the half-year.	Number of Sleepers renewed during the half-year.	Number of Sleepers on the Line at the commencement of the half-year.	Number of Sleepers renewed during the half-year.	Length of Sleepers on the Line at the commencement of the half-year.	Length of Sleepers renewed during the half-year.	Number of Sleepers on the Line at the commencement of the half-year.	Number of Sleepers renewed during the half-year.	Length of Sleepers on the Line at the commencement of the half-year.	Length of Sleepers renewed during the half-year.	Number of Sleepers on the Line at the commencement of the half-year.	Number of Sleepers renewed during the half-year.	Number of Sleepers on the Line at the commencement of the half-year.	Number of Sleepers renewed during the half-year.
Bellary Division...	No.	No.	No.	No.	No.	No.	Length yds.	Lgh. yds.	No.	No.	Lgh. yds.	Lgh. yds.	No.	No.	No.	No.
Gadag Division ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Hubli Division ...	...	...	...	...	16,919	11	3,318	...	...	...	...	...	8,05,418	25	8,55,563	29
Poona Division ...	...	...	...	...	4,06,934	7,178	...	...	...	...	...	...	...	1,033	...	1,033
Kistna Division ...	...	...	...	...	1,11,525	1,452	1,580	...	41,883	...	...	...	73,700	(a) 10,342	73,700	10,342
Mysore Division...	...	...	...	...	1,96,732	476	5,468	...	...	...	...	...	4,05,443	(b) 2,752	4,47,346	2,752
Total ...	1,032	...	1,13,616	...	15,00,952	23,349	10,396	...	41,883	...	...	...	18,161	8	15,181	8

(a) Replaced a corresponding number of wooden sleepers.
 (b) 2,560 of these replaced a corresponding number of Australian wood sleepers.
 (c) 10,132 of these replaced a corresponding number of pine wood sleepers.

APPENDIX C.

SOUTHERN MAHARATTA RAILWAY.

Statement showing the quantity of Ballast collected and spread during the half-year ending 30th June 1894.

Divisions.	QUANTITY						REMARKS.		
	Collected. Cubic feet.			Spread. Cubic feet.					
	Stone.	Sand.	Others.	Total.	Stone.	Sand.		Others.	Total.
Bellary Division	21,657	89,084	.....	1,10,741	.....	80,758	21,708	102,556	
Gadag do.	12,503	5,850	12,661	31,014	31,018	92,230	66,874	190,152	
Hubli do.	261,991	.....	.....	2,61,991	134,132	60,300	.....	203,432	
Poona do.	.....	183,022	191,184	3,77,206	24,035	413,991	203,607	641,633	
Kistna do.	76,100	89,318	81,000	2,49,508	117,740	71,159	132,358	321,257	
Mysore do.	.....	4,09,808	.....	4,09,808	4,000	431,505	.....	435,505	
Total	372,341	777,082	290,815	1,440,268	310,955	1,158,943	424,637	1,894,535	

APPENDIX D.

Statement of Fencing for the half-year ending 30th June 1894.

Particulars.	Line.		Walling.		Wire.	
	Single.	Double.	Single.	Double.	Single.	Double.
	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.
Bellary Division—						
Length at the commencement of the half-year ...	...	29.75	3.25	...	3.25	25.00
Length renewed during the half-year...	...	...	...	...	...	...
Do. newly erected do. ...	...	...	...	...	...	...
Total, Bellary Division ...	...	29.75	3.25	...	3.25	25.00
Gadag Division—						
Length at the commencement of the half-year ...	.50	21.75	2.00	1.00	3.00	11.50
Length renewed during the half-year...	...	...	...	...	...	...
Do. newly erected do. ...	...	...	...	...	...	...
Total, Gadag Division ...	.50	21.75	2.00	1.00	3.00	11.50
Hubli Division—						
Length at the commencement of the half-year ...	.50	8.00	.50	...	.75	95.25
Length renewed during the half-year...	...	...	.02	...	...	...
Do. newly erected do. ...	...	...	...	...	.70	.05
Total, Hubli Division ...	.50	8.00	.50	...	1.45	95.30
Poona Division—						
Length at the commencement of the half-year ...	9.50	14.75	6.50	11.50	.25	41.00
Length renewed during the half-year...	...	...	...	...	...	...
Do. newly erected do. ...	...	...	...	...	...	...
Total, Poona Division ...	9.50	14.75	6.50	11.50	.25	41.00
Kistna Division—						
Length at the commencement of the half-year ...	...	...	...	...	...	...
Length renewed during the half-year...	...	...	...	...	...	...
Do. newly erected do. ...	...	...	...	...	...	...
Total, Kistna Division ...	...	...	...	...	...	...
Mysore Division—						
Length at the commencement of the half-year ...	...	140.50	.50	.50	.50	10.25
Length renewed during the half-year...	...	...	...	...	...	0.15
Do. newly erected do. ...	...	...	...	...	...	0.37
Total, Mysore Division ...	...	140.50	.50	.50	.50	10.62
Abstract.						
Total length of fencing on the line at the commencement of the half-year ...	10.50	214.75	12.75	13.00	7.75	183.00
Do. renewed during the half-year...	...	...	.02	...	...	.15
Do. newly laid do. ...	...	...	...	...	.70	.42
Total length at the end of the half-year...	10.50	214.75	12.75	13.00	8.45	183.42

APPENDIX E.

Statement showing the Bridges painted and Works done to Major Bridges during the half-year ended 30th June 1894.

Divisions.	Bridges painted.	Works done on Major Bridges.
Bellary Division ...	Nil ...	Lugs removed from Hagari Bridge and fixed on Bridges Nos. 6, 17, 21, 22 and 38.
Gadag Division ...	Kistna Bridge on the Bijapur Branch is being painted and 9-60' girder at mile $\frac{27}{11}$, 3-60' girder at mile $\frac{29}{11}$, and 4-40' girder at mile $\frac{19}{8}$, main line, were tarred.	26 sleepers on the Malaprabha Bridge at mile $\frac{30}{14}$ Bijapur Branch were removed.
Poona Division ...	Nil.	Nil.
Kistna Division ...	Nil.	5-40' span added to 1-40' Bridge at mile $\frac{48}{8}$; 2-40' span added to 1-40' girder at mile $\frac{47}{4}$, and 2-20' girders removed from 1-40' and 2-20' Girder Bridge and 2-40' added at mile $\frac{47}{8}$.
Mysore Division...	Nil.	Nil.
Hubli Division ...	Bridges at miles $\frac{47}{4}$, $\frac{50}{7}$, $\frac{51}{17}$, $\frac{11}{10}$, $\frac{12}{18}$, $\frac{15}{8}$, $\frac{16}{8}$, $\frac{45}{8}$, $\frac{46}{8}$ on the Harihar Branch, Bridges at miles $\frac{9}{3}$, $\frac{9}{4}$, $\frac{9}{8}$, $\frac{0}{11}$, $\frac{1}{13}$, $\frac{2}{1}$ and $\frac{2}{8}$ on the main and the Malaprabha Bridge at mile $\frac{16}{8}$, Poona Branch, were tarred.	.....

APPENDIX F.

SOUTHERN MAHRATTA RAILWAY.
POONA DIVISION.*List of Capital Works on the open Line during the half-year ended
30th June 1894.**Commenced.*

Watering arrangements at Pachhapur.
Bogie weigh bridge and house at Miraj.
Covered platform at Belgaum.
Approach road at Kolhapur Station.
Quarters for clerks and menials at Koregaon.
Assistant Station Master's quarters at Sangli.
Clerks' quarters at Sangli.
Quarters for carriage-examining staff, Poona.
Gang huts, 12 units, at mile 259½.
Station building at Shedbal.
Traffic quarters at Poona Junction.
Additions to Goods shed and approach road, Miraj.
Do. do. Satara Road.

Through siding and extension of Goods platform at Karad.
Additional waterways and protective works between mile 242 and 249.
In progress.

Goods shed and sidings at Kudchi.
Additional siding and loading bank platform at Shedbal.
Addition to the bridge at mile 194.
Huts for 2nd gateman at level-crossing at miles 32, 33, 33 and 34.
Improvements to Locomotive Foreman's bungalow at Belgaum.
Protective works, Kolhapur Branch (Kistna River).
Completed.

Locomotive Foreman's bungalow, Ghorpuri.
Protective works for the embankment of the Oodgaon Bridge.
Additional goods accommodation at Belgaum.
Quarters for fuel staff at Walhe.
Additional sidings at Miraj.
Catch-water drain and double 3' culvert at mile 259½.

APPENDIX G.

HUBLI DIVISION.

Commenced.

Improvements of the lighting and ventilation in the workshops at Hubli.
Petty works required to complete the Locomotive Workshops at Hubli.
Additions to Railway Institute at Dharwar.
Quarters for Sergeant Instructor at Hubli.

In progress.

Ballast and permanent-way at Hubli yard.
Shed for storing plate and sheet iron at Hubli.
Engine pits in the Workshop yard at Hubli.
Valve-setting and engine-weighing pits to be covered at Hubli. (In abeyance.)
Fixing rails on top of erecting shop wall for traverser at Hubli.

Completed.

Transparent roof tiles for Foundry, Grinding and Machine Shop, Hubli.
Compound walls to bungalows for Traffic Inspector and Travelling Inspector of
Accounts at Hubli.
Bungalow for Inspector of Works at Hubli.
Compound wall to do.
Approach road to do.
Bungalow for the Depot Store-keeper at Hubli.
Approach to do.
Compound walls do.
8 units Locomotive menials' quarters at Londa.
Service reservoir at Hubli.
Coal sidings do.
Custom and salt shed platform at Castle Rock.

APPENDIX H.

SOUTHERN MAHRATTA RAILWAY.
BELLARY DIVISION.*List of Capital Works on the open Line during the half-year ended
30th June 1894.**Commenced.*

Nil.

In progress.

Tank-house pump and piping, Khadarpett.
Do. do. Anantapur.

Completed.

2' covered drain at mile 124, main line.
Menials' quarters, 22 units, at Bellary.
Lengthening ash pits at Dharmaveram.
Fuel stage at engine-shed do.
Fixing foot planks on bridges, Guntakal-Dharmaveram Section.
Over-bridge for passengers, Dharmaveram.
Penar Bridge, No. 1246, at mile 317.
Bridge No. 1222 at mile 301.
Recreation room, Dharmaveram.
Well at Malugur.
Ashpits and water columns at Khadarpett.
Do. do. Anantapur.
Coal stage, Dharmaveram.

APPENDIX J.

GADAG DIVISION.

Commenced.

Assistant Station Master's quarters and store room at Alur.
Do. do. do. Mallapur.
Wire fencing between miles 55 and 58 on the Bijapur Branch.
Running room for Drivers at Gadag.
Railway Institute at Gadag.
Level-crossings near Bennihulla Bridge.

In progress.

Booking Office and latrine at Lachyan.
Tranship Goods platform and extension of Loading platform at Gadag.
Water-supply to staff quarters at Gadag.

Completed.

Nil.

APPENDIX K.

KISTNA DIVISION.

Commenced.

Quarters for transshipping staff at Guntakal.
Addition of 1 20' girder to the present 1 20' at mile 279½.
Quarters for the clerks of the Resident Engineer's Office at Guntakal.

In progress.

Addition of 5 40' to the present 1 40' girder bridge at mile 468-5.
Addition of 2 40' to the present 1 40' bridge at mile 474.
Removing 2 20' girder from 1 40' and 2 20' and adding 2 40' bridge at mile 475.
2 20' bridge at mile 256.
1 10' do. do. 376.
Approach road with over-bridge at the east end of Guntakal Station.

Completed.

Quarters for the Locomotive and Traffic Departments at Guntakal.
Additional staff quarters required for the Traffic and Locomotive Departments,
Donakonda.

Tranship platform and siding for coal at Guntakal.
 Raising and fencing the passenger platform at Mangalagiri.
 Raising and fencing the passenger platform at Narasaravupet.
 Additions to the Institute at Guntakal.
 Additional waterways between Rangapuram and Nandyal.
 50 additional roof lamps first equipment.

APPENDIX L.

SOUTHERN MAHBATTA RAILWAY.

MYSORE DIVISION.

*List of Capital Works on the open Line during the half-year ended
 30th June 1894.*

Commenced.

Engine shed and sidings at Harihar.
 Ashpit at north end of station at Harihar.
 1 6' rail opening at mile $\frac{82}{12}$. (Cost to be defrayed by the Mysore Darbár).
 Additions to the Assistant Station Master's quarters at Arsikere.
 Station Master's quarters at Arsikere.
 Railway Institute at Arsikere.
 Protective works at mile 177.
 Locomotive Foreman's bungalow at Bangalore.
 Quarters for Europeans and Eurasians at Bangalore.
 Do. for signalmen at Bangalore.
 Do. for menials do.
 Running bungalow do.
 Shunting and safety siding do.
 Cross-over road and sick siding at Arsikere.

In progress.

Additions and alterations to the Locomotive Workshops at Bangalore.
 Goods shed and siding at Gubbi.
 Goods shed and siding at Maddur.
 Do. Do. Holalkere.
 Do. Do. Davangere.

Completed.

Fire-engine shed and hydrants at Arsikere.
 Erecting boundary marks between Harihar and Gubbi.
 Enlargement of goods shed at Tiptur.
 Extending sidings at Mudgere.
 Latrines for natives do.
 Additional siding at Bangalore City Station.
 Watering arrangements at Dodbele.

APPENDIX M.

LOCOMOTIVE AND CARRIAGE DEPARTMENT.

*Statement showing average Mileage run by a Locomotive during the 1st half
 of 1894.*

Item No.	Particulars.	
1	Number of locomotives erected and made over to Locomotive Department ...	
2	Average number of locomotives constantly under repair and renewal...	220
3	Number of locomotives laid by as spare ...	68.83
4	Number of locomotives lent or hired out to other lines ...	3
5	Average number of locomotives 1 - (3 + 4) ...	5
6	Total mileage of locomotives (5) ...	212
7	Average miles run by a locomotive of each class 6 ÷ 5 ...	1,893,420.5
		8,931.23

APPENDIX N.

APPENDIX N.

SOUTHERN MAHARATTA RAILWAY, INCLUDING MYSORE AND KOLHAPUR STATE RAILWAYS.

LOCOMOTIVE AND CARRIAGE DEPARTMENT.

Statement containing particulars of Analyses of Water supplied at the several Stations with remarks as to quality.

No.	Names of Watering Stations.	Source of Supply of Water.	GRAINS PER GALLON.						PARTS PER MILLION.		CLARK'S SCALE.		Name of Analyst.	Opinion expressed on Quality by Analyst.	Date of Analysis.	Remarks by Locomotive Superintendent as to Quality, &c.	
			Total solids.	Volatile solids.	Chlorine.	Lime.	Sulphuric Acid.	Silica.	Magnesia.	Free Ammonia.	Albumenoid.	Nitric Acid.					Total hardness.
Main Line—Castle Rock to Kistna Canal Terminus.																	
1	Castle Rock	Spring	280	...	56	...	...	...	0.03	0.06	...	...	J. B. Lyon	Sediments scanty in Nos. 2, 3, 4, 5, 6, 7, 8, 10, 11, 12 and 13; very scanty in Nos. 1, 2, 4, 5, 6, 7, 8, 10, 11, 12 and 13; consisting chiefly of vegetable debris in all except Nos. 4 and 7; and mineral debris in Nos. 2, 3, 4, 5, 6, 7, 8, 10, 11, 12 and 13; and rather numerous in Nos. 1, 2, 4, 5, 6, 7, 8, 10, 11, 12 and 13; a few monads in Nos. 3 and 5.	11th May 1886	Good.	
2	Londa	River Ponda	1610	...	91	...	...	...	0.03	0.37	...	...	Do.	...	25th July 1888	Good.	
3	Aluvar	Well	3430	...	546	...	...	...	0.40	0.04	...	...	Do.	...	25th July 1888	Moderate.	
4	Kambarganvi	Well	3150	...	294	...	...	...	0.06	0.22	...	...	Do.	...	25th July 1888	Moderate.	
5	Dharwar	Well	4130	...	910	...	...	...	0.03	0.20	...	...	Do.	...	25th July 1888	Not satisfactory.	
6	Hubli...	Jowl Nulla well.	1610	...	406	...	...	...	0.11	0.04	...	...	M. G. Deshmukh	...	25th Oct. 1886	Good.	
7	Annigeri	Well	3360	...	308	...	...	...	0.09	0.11	...	...	J. B. Lyon	...	7th April 1886	Moderate.	
8	Gadag	Well	2310	...	196	...	...	...	0.20	0.12	...	...	Do.	...	7th April 1886	Fair.	
9	Harisapur	Supplied from Gadag.	2310	...	196	...	...	...	0.20	0.12	...	...	Do.	...	7th April 1886	Fair.	
10	Bhanapur	Well	3010	...	182	4.13	3.32	4.34	0.02	0.11	...	...	Do.	...	8th May 1885	Fair.	
11	Hospet	Well	1260	...	164	...	...	...	0.11	0.18	...	...	Do.	...	5th Mar. 1885	Good.	
12	Gadiganur	Well	4340	...	420	...	...	...	0.16	0.20	...	...	Do.	...	5th Mar. 1885	Not satisfactory.	
13	Bellary	Well	3220	...	476	...	...	...	0.11	0.24	...	...	Do.	...	5th Mar. 1885	Moderate.	
14	Hagari	Well near river.	3780	...	784	...	...	...	0.03	0.03	...	...	Do.	...	29th May 1889	Moderate.	
15	Guntakal	Supplied from Nancherla well.	341	10.4	2.4	...	...	...	2.15	0.17	7.36	14.000	W. Gray	Usable	22nd June 1887	Moderate.	
16	Maddikera	Well	3245	10.4	2.24	...	...	...	0.19	0.30	7.3	13.300	H. Allison	Usable	22nd June 1887	Moderate.	
17	Pendekalla	Well	434	7.0	3.08	...	...	...	trace	7.3	13.300	10.050	Do.	Usable	22nd June 1887	Not satisfactory.	
18	Kurnool Road	Well	385	10.5	3.01	...	...	...	trace	25.0	17.850	0.625	Do.	Usable	22nd June 1887	Moderate.	
19	Rungapuram	Well	301	5.6	1.9	...	...	...	1	10.3	11.200	1.050	Do.	Usable	22nd June 1887	Fair.	
20	Betamcherla...	Supplied from Kurnool Road.	385	10.5	3.01	...	...	...	trace	25.0	17.850	0.625	Do.	Usable	22nd June 1887	Moderate.	
21	Panyam	Well	378	6.3	3.9	...	...	...	5	22.5	15.400	6.650	Do.	Usable	22nd June 1887	Moderate.	
22	Gazulpalli	Well	119	24.4	6.4	...	...	...	1.37	1.47	13.650	0.700	Do.	Not ascertainable.	22nd June 1888	Fair.	
23	Mile 1704	River Palardum	...	...	...	...	...	...	...	...	...	...	Do.	...	...	Not analysed.	
24	Digavanetta	Well	...	...	...	...	...	...	...	...	...	...	Do.	...	...	Not analysed.	
25	Somidevipalli	Well	6510	...	1190	...	...	...	0.3	0.21	...	...	Do.	Sediments abundant in Nos. 2, 3, 4, 5, 6, 7, 8, 10, 11, 12 and 13; consisting chiefly of vegetable debris, Paramecia present in all and vorticella also present in No. 2.	6th July 1889	Not satisfactory.	
26	Cumbum	Well	2840	...	3.64	...	...	...	1.71	0.12	...	...	Do.	...	6th July 1889	Fair.	
27	Markapur Road	Well	1820	...	3.22	...	...	...	1.17	0.16	...	...	J. B. Lyon	...	7th Mar. 1889	Good.	
28	Donakonda	Well	2240	...	1.89	...	...	...	0.2	0.20	...	...	Do.	...	7th Mar. 1889	Fair.	
29	Gundakamma	Well near nulla.	3920	...	3.43	...	...	...	0.11	0.23	...	...	Do.	...	7th Mar. 1889	Moderate.	
30	Santanagalur	Nulla well	...	...	...	...	...	...	...	...	...	...	Do.	...	...	Not analysed.	
31	Satur	Well	27415	10.51	4.418	1.40	84.63	...	1.963	trace	5.250	0.700	J. L. VanGeyzel.	Unfit for boiler as well as for domestic purposes.	31st Oct. 1889	Bad.	
32	Guntur	Well	154	4.2	1.47	...	...	...	0.39	3.68	4.900	1.050	J. L. VanGeyzel.	Usable	17th Jan. 1890	Not analysed.	
33	Kistna Canal minus.	Well near Kistna Canal.	...	...	...	...	...	...	...	...	...	...	Do.	...	...	Good.	
34	Khanapur	Nulla	770	...	0.98	...	...	...	0.09	...	...	...	J. D. Collis	Good, potable waters	3rd June 1889	Good.	
35	Belgaum	Well	280	...	3.64	...	...	...	0.1	...	...	...	Do.	...	3rd June 1889	Fair.	
Poona and Kolhapur Branches—Khanapur to Poona.																	

Poonas and Kolhapur Branches—Khanapur to Poonas.

36	Pachhapur	Well	12110	...	...	...	...	...	...	...	...	...	J. D. Collin Barry	Sediments scanty; consisting chiefly of vegetable debris in No. 38.	31st May 1889	Bad.
37	Mile 74/4	Well	3360	...	...	...	...	...	...	...	...	...	M. G. Deshmukh	Sediments scanty; consisting chiefly of vegetable debris in No. 38.	22nd April 1889	Not analysed.
38	Kutchi	Well	...	...	...	...	...	...	...	...	...	...	J. B. Lyon	Sediments scanty; consisting chiefly of vegetable debris in No. 38.	3rd Aug. 1889	Fair.
39	Miraj	Well	5320	...	...	...	...	...	...	...	...	...	J. B. Lyon	Sediments scanty; consisting chiefly of vegetable debris in No. 38.	3rd Aug. 1889	Not analysed.
40	Hatkanagale	Well	...	...	...	...	...	...	...	...	...	...	J. B. Lyon	Sediments scanty; consisting chiefly of vegetable debris in No. 38.	3rd Aug. 1889	Not analysed.
41	Kolhapur	Town water.	...	...	...	...	...	...	...	...	...	...	J. B. Lyon	Sediments scanty; consisting chiefly of vegetable debris in No. 38.	3rd Aug. 1889	Not analysed.
42	Kundal Road	Well	2240	...	...	...	...	...	...	...	...	...	J. B. Lyon	Sediments scanty; consisting chiefly of vegetable debris in No. 38.	3rd Aug. 1889	Fair.
43	Kard	Well	2170	...	...	...	...	...	...	...	...	...	Do.	Sediments scanty; consisting chiefly of vegetable debris in No. 38.	3rd Aug. 1889	Fair.
44	Targoon	Well	3240	...	...	...	...	...	...	...	...	...	Do.	Sediments scanty; consisting chiefly of vegetable debris in No. 38.	3rd Aug. 1889	Fair.
45	Koregon	Well	3080	...	...	...	...	...	...	...	...	...	Do.	Sediments scanty; consisting chiefly of vegetable debris in No. 38.	3rd Aug. 1889	Fair.
46	Wathar	Well	2520	...	...	...	...	...	...	...	...	...	Do.	Sediments scanty; consisting chiefly of vegetable debris in No. 38.	3rd Aug. 1889	Fair.
47	Salpa	Well	3780	...	...	...	...	...	...	...	...	...	Do.	Sediments scanty; consisting chiefly of vegetable debris in No. 38.	3rd Aug. 1889	Fair.
48	Walle	Well	1980	...	...	...	...	...	...	...	...	...	Do.	Sediments scanty; consisting chiefly of vegetable debris in No. 38.	3rd Aug. 1889	Fair.
49	Rajewali	Well	2310	...	...	...	...	...	...	...	...	...	Do.	Sediments scanty; consisting chiefly of vegetable debris in No. 38.	3rd Aug. 1889	Fair.
50	Phursangi	Well	3250	...	...	...	...	...	...	...	...	...	Do.	Sediments scanty; consisting chiefly of vegetable debris in No. 38.	3rd Aug. 1889	Fair.
51	Poonas	Irrigation.	...	...	...	...	...	...	...	...	...	...	Do.	Sediments scanty; consisting chiefly of vegetable debris in No. 38.	3rd Aug. 1889	Not analysed.
52	Saunshi	Well	9100	...	...	...	...	...	...	...	...	...	Do.	Sediments very scanty in No. 53, and scanty in the rest; consisting chiefly of vegetable debris.	7th Jan. 1887	Bad.
53	Yalgi	Well	4270	...	...	...	...	...	...	...	...	...	Do.	Sediments very scanty in No. 53, and scanty in the rest; consisting chiefly of vegetable debris.	7th Jan. 1887	Not satisfactory.
54	Haveri	Well	1960	...	...	...	...	...	...	...	...	...	J. B. Lyon	A few paramacia in No. 55 and a little clay paramacia in No. 52.	24th Aug. 1887	Good.
55	Ranibennur	Well	2520	...	...	...	...	...	...	...	...	...	Do.	No infusoria in No. 53.	24th Aug. 1887	Fair.
56	Harhar	Well	10050	...	...	...	...	...	...	...	...	...	J. D. Collin Barry	Sediments scanty; consisting chiefly of vegetable debris, saccharous and discoloured; none in No. 59; a few paramacia in Nos. 56, 57 and 58. No infusoria in No. 59.	31st May 1889	Bad.
57	Kodaganur	Well	3080	...	...	...	...	...	...	...	...	...	Do.	Sediments scanty; consisting chiefly of vegetable debris, saccharous and discoloured; none in No. 59; a few paramacia in Nos. 56, 57 and 58. No infusoria in No. 59.	31st May 1889	Fair.
58	Halakere	Well	15470	...	...	...	...	...	...	...	...	...	Do.	Sediments scanty; consisting chiefly of vegetable debris, saccharous and discoloured; none in No. 59; a few paramacia in Nos. 56, 57 and 58. No infusoria in No. 59.	31st May 1889	Bad.
59	Shivani	Well	3220	...	...	...	...	...	...	...	...	...	J. B. Lyon	Sediments scanty; consisting chiefly of vegetable debris, saccharous and discoloured; none in No. 59; a few paramacia in Nos. 56, 57 and 58. No infusoria in No. 59.	23rd March 1887	Moderate.
60	Kadur	Well	2730	...	...	...	...	...	...	...	...	...	Not ascertainable.	Sediments scanty; consisting chiefly of vegetable debris, saccharous and discoloured; none in No. 59; a few paramacia in Nos. 56, 57 and 58. No infusoria in No. 59.	5th Jan. 1891	Not analysed.
61	Arsikere	Well	...	...	...	...	...	...	...	...	...	...	Do.	Sediments scanty; consisting chiefly of vegetable debris, saccharous and discoloured; none in No. 59; a few paramacia in Nos. 56, 57 and 58. No infusoria in No. 59.	10th May 1889	Fair.
62	Tiptur	Well	...	...	...	...	...	...	...	...	...	...	Do.	Sediments scanty; consisting chiefly of vegetable debris, saccharous and discoloured; none in No. 59; a few paramacia in Nos. 56, 57 and 58. No infusoria in No. 59.	...	Not analysed.
63	Mile 184	Tank	...	...	...	...	...	...	...	...	...	...	Do.	Sediments scanty; consisting chiefly of vegetable debris, saccharous and discoloured; none in No. 59; a few paramacia in Nos. 56, 57 and 58. No infusoria in No. 59.	...	Not analysed.
64	Banasandra	Well	15400	...	...	...	...	...	...	...	...	...	W. Gray	Sediments scanty; consisting chiefly of vegetable debris, saccharous and discoloured; none in No. 59; a few paramacia in Nos. 56, 57 and 58. No infusoria in No. 59.	...	Not analysed.
65	Gabbu	Well	...	...	...	...	...	...	...	...	...	...	Do.	Sediments scanty; consisting chiefly of vegetable debris, saccharous and discoloured; none in No. 59; a few paramacia in Nos. 56, 57 and 58. No infusoria in No. 59.	...	Not analysed.
66	Tumkur	Well	...	...	...	...	...	...	...	...	...	...	Do.	Sediments scanty; consisting chiefly of vegetable debris, saccharous and discoloured; none in No. 59; a few paramacia in Nos. 56, 57 and 58. No infusoria in No. 59.	...	Not analysed.
67	Dodbele	Well	...	...	...	...	...	...	...	...	...	...	Do.	Sediments scanty; consisting chiefly of vegetable debris, saccharous and discoloured; none in No. 59; a few paramacia in Nos. 56, 57 and 58. No infusoria in No. 59.	...	Not analysed.
68	Golhalli	Well	...	...	...	...	...	...	...	...	...	...	Do.	Sediments scanty; consisting chiefly of vegetable debris, saccharous and discoloured; none in No. 59; a few paramacia in Nos. 56, 57 and 58. No infusoria in No. 59.	...	Not analysed.
69	Bangalore	Tank	...	...	...	...	...	...	...	...	...	...	Do.	Sediments scanty; consisting chiefly of vegetable debris, saccharous and discoloured; none in No. 59; a few paramacia in Nos. 56, 57 and 58. No infusoria in No. 59.	...	Not analysed.
70	Kengeri	Well	...	...	...	...	...	...	...	...	...	...	Do.	Sediments scanty; consisting chiefly of vegetable debris, saccharous and discoloured; none in No. 59; a few paramacia in Nos. 56, 57 and 58. No infusoria in No. 59.	...	Not analysed.

Mysore State Railway—Harhar to Nanjangud.

No.	Names of Watering Stations.	Source of Supply of Water.	GRAINS PER GALLON.						PARTS PER MILLION.			CLARKE'S SCALE.		Name of Analyst.	Opinion expressed on quality by Analyst.	Date of Analysis.	Remarks by Locomotive Superintendent as to quality, &c.	
			Total solids.	Volatile solids.	Chlorine.	Lime.	Sulphuric Acid.	Silica.	Magnesia.	Free Ammonia.	Albumenoid Ammonia.	Nitric Acid.	Total hardness.					Permanent hardness.
Mysore State Railway—Harivar to Nanyangud—continued.																		
71	Bidadi	Well	23.80	...	2.10	...	...	...	...	...	...	...	...	J. D. Collis Barry.	Sediments scanty; chiefly of vegetable debris. Fit for potable purposes.	.....	Fair.	
72	Channapatna	Well	...	...	...	...	...	...	...	...	...	...	...	...	...	...	Not analysed.	
73	Maddur	Tank	...	...	...	...	...	...	...	...	...	...	...	...	...	...	Not analysed.	
74	Nandya	Well	...	...	...	...	...	...	...	...	...	...	...	...	...	...	Not analysed.	
75	Paschamvahnai	River Cauvery	...	...	...	...	...	...	...	...	...	...	...	...	...	...	Not analysed.	
76	Mysore	Well	...	...	...	...	...	...	...	...	...	...	...	...	...	...	Not analysed.	
77	Nauyangud	Well	...	...	...	...	...	...	...	...	...	...	...	...	...	...	Not analysed.	
Bijapur Branch—Mallapur to Hoigi.																		
78	Mallapur	Supplied from Gadag.	23.10	...	1.96	...	...	...	...	...	...	...	...	J. B. Lyon	Sediments scanty and a few paramnesia.	7th April 1886	Fair.	
79	Alur	Well close by river Malaprabha.	26.6	...	6.72	...	1.82	...	...	...	...	...	...	Do.	Good	19th June 1884	Fair.	
80	Katgeri	Well	55.3	...	10.64	11.9	1.06	56.0	traces	...	...	...	...	Do.	Fair	19th June 1884	Not satisfactory but scarcely ever used.	
81	Bagalkot	Well	39.9	...	4.62	...	1.54	...	...	...	...	...	...	Do.	Good	30th Sept. 1884	Moderate.	
82	Almati	Well close by river Kistna.	30.8	...	5.60	...	4.69	...	...	...	...	...	...	Do.	Good	30th Sept. 1884	Moderate.	
83	Telgi	Well	31.5	...	1.75	...	...	...	...	...	...	...	...	Do.	Good	30th Sept. 1884	Moderate.	
84	Mulvad	Well	32.2	...	1.81	...	1.44	...	...	...	...	...	...	Do.	Fair	25th Nov. 1884	Moderate.	
85	Bijapur	Well	45.5	...	6.51	...	5.88	...	...	...	...	...	...	Do.	Fair	25th Nov. 1884	Not satisfactory.	
86	Minchnal	Well near nullah.	25.9	...	3.64	...	1.05	...	...	...	...	...	...	Do.	Fair	25th Nov. 1884	Not analysed.	
87	Nimbal	Well near nullah.	23.8	...	1.26	...	traces	...	...	...	...	...	...	Do.	Good	8th Jan. 1885	Fair.	
88	Tadval	Well	25.2	...	1.82	...	traces	...	...	...	...	...	...	Do.	Good	8th Jan. 1885	Fair.	
89	Hoigi	Well	...	...	...	...	...	...	...	...	...	...	...	...	...	...	Fair.	
Guntakal-Bangalore Section—Khadarpett to Dodballapur.																		
90	Khadarpett	Well	78.53	10.51	15.35	...	...	...	...	...	...	...	9.800	0.350	H. VanGeyzel	Suspicious as a drinking water; fit for boiler work.	11th July 1890	Not satisfactory.
91	Anantapur	Well	24.54	8.41	1.26	...	...	...	...	...	...	...	10.850	2.450	Do.	Usable for drinking and for Locomotive purposes.	24th Oct. 1890	Fair.
92	Dharmavaram	Well	61.70	10.51	5.74	...	...	...	...	...	...	...	8.400	0.350	Do.	...	2nd May 1890	Not satisfactory.
93	Guttur	Well	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	Not analysed.
94	Chakralpalli	Well	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	Not analysed.
95	Hindupur	Well	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	Not analysed.
96	Thondabhavi	Well	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	Not analysed.
97	Dodballapur	Well	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	Not analysed.

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No. 1908 of 1894.

To R
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P. W. DEPARTMENT, RAILWAY BRANCH:

Bombay Castle, 24 September 1894.

To

The Joint Secretary to the Government of Madras,

Public Works Department,

Railway Branch.

Sir,

I am directed to forward, for your information, copies of the periodical Inspection Report of the Southern Mahratta Railway (including the Mysore, Kolhapur, and Bellary Kistna State Railways) for the 1st half of 1894.

I have the honour to be,

Sir,

Your most obedient servant,

Redyam.

Ag: Under Secretary to Government.

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